



ACCEPTANCE OF SHOP ORDER AND APPROVAL DRAWINGS

We appreciate your order for a Ferrara apparatus. In order to confirm our mutual understanding of the vehicle we will be building for you; we ask that you carefully review the enclosed shop order and approval drawings. If these documents meet with your approval, we ask that you initial at the bottom of each page of the shop order, sign the approval drawings and this acceptance form and return each set of the original documents to Eric Adams within 14 days of receipt. We also suggest that you retain a copy of each set of documents for your files.

The approval drawings and shop order are the plans and instructions we will use to build your vehicle and to ensure that it is built to your specific criteria. As your vehicle moves through our production process, these documents will be used for all inspections and quality assurance. Any modifications or changes you wish to make to your vehicle after acceptance by you of the shop order and approval drawings must be accompanied by a written change order request that we provide. The change order request will be reviewed by engineering for approval. These change orders must be acknowledged and approved by both parties and will supersede any previously issued specifications and approval drawings with regards to the changed items only. Each change order issued after acceptance of these shop order and approval drawings will result in an administrative change order fee of \$150 per change order in addition to the price of the items changed. Major body changes will not be allowed after the unit has entered the construction process.

If you have any questions with regard to the enclosed documents, please contact your sales representative. We appreciate your business and look forward to providing you with the best built apparatus in the industry.

Ferrara Truck Number: H7227

Department/Customer: Bulldog Fire Apparatus Invader Retail Unit

Signature: _____

Printed Name: _____

Title: _____

Date: _____



Shop Order

Bulldog Fire Apparatus
Invader Retail Pumper

jvn@FF1.com

Exp. Date: 11/19/2022 **Create Date:** 10/20/2022 **Rev. Date:** 10/18/2023
Quote No: BFAInvaderPumper-0001
Job/Order No: H7227
PUMPER: FMP-35-100 Custom Pumper - Extruded / Modular
LEGALS: FFA-00-300 Legals - Pumpers (1022V1)
CHASS-CUSM: FCH-30-100 Chassis - Custom Tilt Cab
CHASS-MODS: FCM-70-100 Chassis Modifications - Spartan Chassis
PUMP-ENC: FPE-20-100 Pump Enclosure - Side Mount
BODY: FBP-33-200 Body - Extruded Pumper (500-1250 Gallons)
BODY-CMNT: FBC-30-100 Body Components - Pumpers
ELE-CMPNT: FEC-30-200 Elec. Components - Pumper Custom
PAINT: FPC-10-200 Paint - Extruded Bodies
WRNTY-MNLS: FWM-50-100 Warranty / Manuals - Pumpers Custom
EQUIPMENT: FEP-30-100 Loose Equipment Pkg. - Pumper

10/18/2023

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PART NO	S	DESCRIPTION	QTY	ID
		== <i>Legals - Pumpers (1022V1) - 1022.001 10/01/22</i> ==		<i>FE</i>
00-06-0420		Payment Terms: Ferrara Standard	1	FE
00-12-0220		Single Source Manufacturer	1	FE
00-12-0420		Manufacturer - Virtual	1	FE
00-12-0620		<i>Principal Dimensions</i>	1	<i>FE</i>
		The apparatus shall have the following approximate dimensions:		
		Overall Length: 32' 3-3/4"		
		Overall Height: 9' 7-1/2"		
		Wheelbase: 186"		
		Cab to Axle: 126"		
00-12-0820		Certified Welders	1	FE
00-14-0620		Drawings - Approval	1	FE
00-18-0820		<i>Vehicle Transportation - DEALERS ONLY!!!!!!!</i>	1	<i>FE</i>
00-18-2020	XS	<i>Delivery Time - Pumpers / Tankers</i>	1	<i>FE</i>
		The pumper / tanker apparatus will have the following delivery schedule after receipt of the order.		
		Commercial Pumper / Tanker: 780 Days		
		Custom / Commercial Industrial Pumper / Tanker: 810 Days		

PART NO	S	DESCRIPTION	QTY	ID
00-E2-0420	U	<p>Custom Pumper / Tanker: 720 Days</p> <p>The manufacturer will not be held liable for changes arising from its failure to make or delay in making delivery because of fire, flood, strike, riot, supply chain, work force shortages, accidents, acts of God or any circumstances beyond our control.</p> <p>== Chassis - Custom Tilt Cab - 1022.001 10/01/22 ==</p> <p>Chassis - Spartan Invader EMFD (10" Raised Roof / 47K GVW / L9 450 Engine)</p> <p>Make / Model: Spartan Invader</p> <p>Year Model: 2025</p> <p>Cab: EMFD w/10" raised roof and full length doors</p> <p>Cab Color: Red FLNA 31979</p> <p>Engine: Cummins L9 450 horsepower</p> <p>Transmission: Allison 3000 EVS</p> <p>Wheelbase: 186"</p> <p>Rear Overhand: 52"</p> <p>Pump Set (C/L of suction to CL rear axle): 96"</p> <p>Pump Set (C/L of suction to CL rear axle): 90"</p> <p>Additional Spartan Provided Options:</p> <p>Weldon VMUX Electrical System w/Driver's Vista Screen</p> <p>6-Place Blue Sea Fuse Block (Behind Driver's Seat)</p> <p>Pump Shift Controls</p> <p>Aluminum Wheels</p> <p>Electronic Stability Control</p> <p>Front & Rear Disc Brakes</p> <p>Steel Channel Front Pumper (Red)</p> <p>21" Front Bumper Extension w/Gravelshield</p> <p>5" Front Suction Piping (RH OB)</p> <p>2" Front Jump Line Piping (LH)</p> <p>Center Bumper Compartment w/Seat Belt Straps</p> <p>Dual Hadley Air Horns (R / L OB) w/Switches</p> <p>CPI 100 Watt Speaker (RH OB)</p> <p>Fully Recessed Mount Q2B Siren (LH OB)</p> <p>Power Windows</p> <p>Bostrom SecureAll SCBA seat Brackets</p> <p>Jump Studs (Driver's Step Well Area)</p> <p>Kussmaul Battery Charger</p>	1	FE

PART NO	S	DESCRIPTION	QTY	ID
		Auto Eject Receptacle (DS Cab Wheel Well) Yellow Cover w/Integrated Display LED Headlights Whelen 72" Freedom Light Bar FireTech 46" Brow Light (White Housing) Whelen M6 Series Front Turn Signals Whelen M6 Series Red / Blue Front Warning Lights Whelen M6 Series Red / Blue Bumper End Warning Lights Whelen Pioneer Surface Mount Scene Lights (Cab Sides) Whelen PFH2 Telescoping Lights (Back of Cab) FRC Max Vision Cab Water Level Lights Whelen 295HFS2 Siren		
		== Chassis Modifications - Spartan Chassis - 1022.001 10/01/22 ==		FE
10-H4-1830		Fire Pump Installation (Spartan Chassis Only)	1	FE
18-M8-8020		Camera Installation - Chassis Supplied The Spartan / Ford supplied back-up camera will be installed on the rear of the apparatus and connected to the cab monitor.	1	FE
		NFPA SAFETY SIGNS		FE
18-P2-0220		Safety Signs - General Requirements	1	FE
18-P2-2420		Safety Sign - Cab Seating, FEMA14 This vehicle has a seating capacity of 6 personnel.	1	FE
18-P2-4020		Safety Signs - Intake/Discharge Cap Pressure, FAMA18	1	FE
18-P2-4220		Safety Signs - Hose Restraint Required, FAMA22	1	FE
18-P2-4420		Safety Signs - Climbing Method Instruction, FAMA23	1	FE
18-P2-4620		Safety Signs - Riding on Exterior, FAMA24	1	FE
18-P2-4820		Safety Sign - Pump Training, FAMA25	1	FE
18-P2-6020		Safety Signs - No-Step, FAMA26	1	FE
18-P4-1020		Safety Sign - Apparatus Movement Warning	1	FE
18-P6-0220		Plate - Fluid Capacity	1	FE
18-P6-0420		Plate - Overall Height / Length / Weight	1	FE
		== Pump Enclosure - Side Mount - 1022.001 10/01/22 ==		FE
20-A2-0220		Pump Module - Side Mounted Extruded / Modular	1	FE
20-A4-2220		Separate Pump Module - Extruded / Modular	1	FE
20-A4-4020		Trim - Dunnage Area, Tread Plate	1	FE
20-C4-0220		Pump Panels - Black Anodized Aluminum	1	FE
20-C6-1020		Pump Panel - Fully Hinged, Right Side	1	FE
20-D6-0220		Light - Left Side Pump Panel, LED Strip	1	FE
20-D6-1220		Light - Right Side Pump Panel, LED Strip	1	FE
20-D8-0620		Light - Pump Compartment, LED	1	FE
20-F2-1820		Steps - Intermediate Pump Panel, Left / Right Side	1	FE
20-F4-0420		Running Boards - Aluminum Tread Plate, Left & Right Side	1	FE
20-F4-2020		Hose Tray - Running Board The tray will be located in the driver's side pump panel running board and will house 25' of 5" large diameter supply hose.	1	FE

PART NO	S	DESCRIPTION	QTY	ID
20-F4-2620		Hose Tray Mounting - Floating/Drop In Style w/45-Degree Bottom Corners	1	FE
20-G4-2220		Handrails (2) - Above Dunnage Area, 12" Knurled Stainless Steel	1	FE
20-H4-0820		Switch - Air Horn, Pump Panel	1	FE
20-J2-0220		Gauges - Master Suction / Pressure, 4-1/2" White Face	1	FE
20-J4-1620		Pressure Governor - FRC Pump Boss PBA500-D10	1	FE
20-J4-4020		Return Line - Fill Subsurface	1	FE
20-J6-0220		Gauges - 2-1/2" Pressure, White Face	1	FE
20-J6-6220		Gauge Bezels - Color Coded	1	FE
20-M4-0220		Tags - Pump Panel, Color Coded (Metal)	1	FE
		PUMP / COMPONENTS / ACCESSORIES		FE
22-A2-0420		Pump System - 1250-2000 GPM Single Stage, Hale QMAX	1	FE
22-F2-0220		Packing Glands - Hale	1	FE
22-J2-0220		Primer - Pump, Hale Model ESP (Oil Less)	1	FE
22-P2-0220		Valve - Master Pump Drain	1	FE
22-P2-1220		Valve - Individual Drain, 3/4" 1/4 Turn	1	FE
22-R2-0220		Pump Test Points - Hale Pumps	1	FE
22-R2-2020		Certification - Pump, 1750 GPM Pump	1	FE
22-R4-0420		Plate - Pump Test Certification	1	FE
24-A2-1620		Steamer Inlets - 6" w/Long Handle Cap, Left & Right Side	1	FE
24-C2-1220	S	Suction - Front, 5" Two-(2) 3/4" ball valves will be provided for the front suction located at the lowest points of the plumbing and will be properly labeled. The valves shall have a cast bronze body, with a 1/4 turn, chrome plated bronze ball, reinforced Teflon seals, and blow-out-proof stem rated to 600 PSI.	1	FE
24-C2-4620		Control - Front Suction, Manual Valve The handwheel control shall be a Trident brand with center position indicator.	1	FE
24-D8-0220		Plumbing - Front Suction, Stainless Steel	1	FE
24-E2-6000		Valve - Front Suction Relief	1	FE
24-G2-0620		Swivel - Front Suction, 6"	1	FE
24-J8-0420		Valve - Intake Relief	1	FE
24-R2-0420		Tank-To-Pump - 3" Valve w/Push-Pull Control	1	FE
24-S6-0820		Tank Fill - 2" Valve w/Push-Pull Control	1	FE
24-T2-0420		Cooler - Engine, 1/2" Line w/ 1/4 Turn Valve	1	FE
24-T2-0620		Cooler - Pump, 3/8" Line w/ 1/4 Turn Valve	1	FE
24-W2-0220		Plumbing - Stainless Steel	1	FE
24-W4-0220		Plumbing Finish - Natural	1	FE
26-A2-0220		Apparatus Valves - Akron Brass 8800 Series	1	FE
26-D2-0420		Suction - Left Side, 2-1/2" Valve w/Swing Control at Valve	1	FE
28-00-0100		DISCHARGE OUTLETS - SIDE MOUNT	1	FE
28-00-0420		All 2-1/2" Side Discharge Outlets Terminate REMOVABLE 30-Degree Elbows	1	FE
28-A2-0220		Discharge - Front Bumper w/ Swivel - thru Tread Plate (DS)	1	FE
28-A8-0220	S	Discharge - Front Bumper, 2" Valve w/Push Pull Control	1	FE

PART NO	S	DESCRIPTION	QTY	ID
28-A8-6020		Discharge - Swivel Stop, Tread plate	1	FE
28-D2-0420		Crosslays (2) - Single Lay, 2" Valve w/Push Pull Control The crosslays will have a minimum capacity of 200' of 1-3/4" of double jacket fire hose w/nozzle.	1	FE
28-D6-0220		Crosslay - Single Lay, 2-1/2" Valve w/Push Pull Control The crosslays will have a minimum capacity of 200' of 2-1/2" of double jacket fire hose w/nozzle.	1	FE
28-D8-0820		Cover - Hypalon w/End Flaps, Crosslays	1	FE
28-D8-4420		End Flaps - Cargo Net w/Seat Belt Buckles, Crosslays	1	FE
28-D8-6220		Cover/End Flaps Color: Black	1	FE
28-H8-0420		Discharges (2) - Left Side, 2-1/2" Valve w/Push-Pull Control	1	FE
28-K4-0220		Discharge - Right Side, 2-1/2" Valve w/Push-Pull Control	1	FE
28-K4-6220		Discharge - Right Side, 4" Valve w/Handwheel Control The handwheel control shall be a Trident brand with center position indicator.	1	FE
28-Q2-0820		Discharge - Deck Gun, 3" Valve w/Handwheel Control The handwheel control shall be a Trident brand with center position indicator.	1	FE
28-V2-1020		Discharge - Left Rear, 2-1/2" Valve w/Push-Pull Control	1	FE
28-V8-8020		Elbow - 2-1/2 FNST x 2-1/2" MNST Chrome 30 Degree, Trident 01.010.0	1	FE
28-W2-1020		Discharge - Right Rear, 2-1/2" Valve w/Push-Pull Control	1	FE
28-W8-8020		Elbow - 2-1/2 FNST x 2-1/2" MNST Chrome 30 Degree, Trident 01.010.0	1	FE
		== Body - Extruded Pumper (500-1250 Gallons) - 1022.001 10/01/22		FE
		==		
		WATER TANKS / COMPONENTS / ACCESSORIES		FE
32-A2-2820		Water Tank - Polypropylene, 750 Gallons	1	FE
32-A6-0220		Special Tank Configuration - "L" Shaped	1	FE
32-D8-0420		Certification - NFPA Water Tank Size	1	FE
34-A2-1220		Gauge - Water Level, Tank Vision Pro WLA300-A00	1	FE
52-A2-0220		Body - 96" Wide, Extruded Aluminum	1	FE
52-A6-4020		Body Sub Frame - Extruded Aluminum	1	FE
52-A6-6020		Body/Compartment Construction - 96" Wide Body	1	FE
52-A6-8020		Compartment Tops/Catwalk - Standard	1	FE
52-A8-0420		Wheel Well Panels & Fenders - Body, Painted Aluminum	1	FE
52-A8-0620		Fenderettes - Polished Stainless Steel	1	FE
52-A8-1020		Hose Bed - 67-1/2" Wide	1	FE
52-D6-4220		Compartments- Left Side, Rescue Style	1	FE
		L1 There shall be one-(1) left front compartment installed ahead of the rear axle. The interior dimensions will be approximately 31" wide x 72" high x 25" deep in the lower section and 12" deep in the upper section.		

PART NO	S	DESCRIPTION	QTY	ID
52-F4-2040		<p>L2 There shall be one-(1) compartment installed above the wheel well. The interior dimensions will be approximately 58" wide x 40" high x 12" deep.</p> <p>L3 There shall be one-(1) left rear compartment installed behind the rear axle. The interior dimensions will be approximately 48" wide x 72" high x transverse in the lower section and 12" deep in the upper section.</p> <p><i>Compartments - Right Side, Low Side</i></p> <p>R1 There will be one-(1) right front compartment installed ahead of the rear axle. The interior dimensions will be approximately 31" wide x 28" high x 25" deep.</p> <p>R2 There will be one-(1) right rear compartment installed behind the rear axle. The interior dimensions will be approximately 48" wide x 28" high x transverse.</p>	1	FE
52-J8-0420		<p><i>Compartment - Center Rear, Standard Height</i></p> <p>B1 There shall be one-(1) compartment installed at the center rear of the apparatus. The compartment shall have an interior dimension of approximately 46" wide x 28" high x 30" deep.</p>	1	FE
56-D8-0220		<p><i>Compartment Doors - Hinged, Flush Look</i></p> <p>There will be a hinged door installed on compartment R1 and compartment R2.</p>	2	FE
56-D8-0620		<p><i>Compartment Door - Roll Up, Satin Finish</i></p> <p>There will be a ROM satin finish door installed on compartment L1, compartment L2, compartment L3 and compartment B1.</p>	4	FE
56-D8-1020		<p><i>Door Extension - Paddle Latch (Hinged Doors Only)</i></p> <p>The paddle latch extension will be installed on compartment R2.</p>	1	FE
56-D8-1420		<p><i>Pull Down Strap - Compartment Door</i></p> <p>There will be a pull down door strap installed on compartment L1, compartment L2 and compartment L3.</p>	3	FE
56-D8-4020		<p><i>Keyed Lock - Compartment Door</i></p> <p>The keyed lock will be installed on compartment L1 roll-up door.</p>	1	FE
56-D8-4620		<p><i>Drip Pan - Door Interior (Roll Up Doors Only)</i></p> <p>There will be a interior drip pan installed on compartment L1,</p>	4	FE

PART NO	S	DESCRIPTION	QTY	ID
		compartment L2, compartment L3 and compartment B1.		
58-A0-0420		<i>Rear Body Construction - Flat Back Design</i>	1	FE
58-A0-1820		<i>Step - Intermediate Rear, Aluminum Tread Plate</i>	1	FE
60-A2-4820		Vertical Load Test - Body	1	FE
62-A2-0220		Brackets - Extension/Roof, Right Side of Body	1	FE
62-B2-1220		<i>Tubes (2) - Pike Pole Storage</i>	1	FE
		The tubes will be located on top of right side compartments inboard of the attic ladder.		
		The tubes will be notched for NY roof hooks.		
64-B2-0620		<i>Compartment - Wheel Well Triple Air Bottle (FFA)</i>	2	FE
		There will be a triple bottle compartment located in the driver's and officer's rearward wheel well panels.		
64-B2-1020		<i>Compartment - Wheel Well Double Extinguisher (FFA)</i>	1	FE
		There will be a double bottle compartment located in the officer's front wheel well panel.		
		The door will be a triple bottle style door.		
64-B2-1420		<i>Compartment - Wheel Well Equipment Storage (FFA)</i>	1	FE
		There will be an equipment storage compartment located in the driver's front wheel well panel.		
64-B8-0220		<i>Doors - Wheel Well Compartments, Stainless Steel</i>	1	FE
66-A2-0220		Body Trim Package	1	FE
66-A2-0620		Body Trim - Vertical Handrails (2), Knurled Aluminum	1	FE
66-A2-1221	U	<i>Body Trim - Rear Stanchion</i>	1	
		The officer's side stanchion will extend no further than the side of the body and shall be positioned so the top of the lights does not exceed the body height.		
66-A2-2420		Fuel Fill - Recessed w/Door, Left Side	1	FE
66-A2-4420		Mud Flaps - Rear	1	FE
66-A2-4620		Rub Rail - Extruded Aluminum	1	FE
66-A4-1040		<i>Step - 12" Rear, Aluminum Tread Plate</i>	1	FE
		The corners of the rear step will be cut at a 45 degree angles.		
66-A4-4420		<i>Step - Chrome Folding, Front of Body</i>	5	FE
		There will be three-(3) steps on the left front compartment face and two-(2) on the right.		
66-A4-6220		<i>Step - Chrome Folding, Rear of Body</i>	4	FE
		There will be two-(2) steps located on each side of the apparatus outboard of compartment B1.		

PART NO	S	DESCRIPTION	QTY	ID
66-A4-8820		Tow Eyes (2) - Rear, Below Body	1	FE
66-A6-2220		Handrail - Below Hose Bed, Knurled Stainless Steel	1	FE
66-A6-2820		<i>Handrail - Between Stanchions, Knurled Stainless Steel</i>	1	FE
66-A6-6420		<i>Handrail - Front of Body, 12" Knurled Stainless Steel</i>	2	FE
The handrails will be mounted at final inspection.				
66-A8-1625		<i>Divider - Hose Bed, Pumper (Heavy Duty)</i>	3	FE
66-A8-4220		Cover - Hose Bed, Hypalon	1	FE
66-A8-7620		<i>End Flap - Cargo Net w/Seat Belt Buckles, Hose Bed</i>	1	FE
66-A8-8220		<i>Cover/End Flap Color: Black</i>	1	FE
66-A8-8820		<i>Hose Bed Capacity</i>	1	FE
The hose bed shall have the capacity to hold the following (left to right):				
500' 1 3/4" DJ hose (double stack above D/S discharge)				
500' 3" DJ hose				
1000' 5" Rubber LDH				
250' 2 1/2" DJ Hose (single stack above P/S discharge)				
A safety sign FAMA22, which warns of the need to secure hose, shall be visible to personnel at the hose storage area.				
== Body Components - Pumpers - 1022.001 10/01/22 ==				FE
== Elec. Components - Pumper Custom - 1022.001 10/01/22 ==				FE
***** ELECTRICAL / COMPONENTS / ACCESSORIES *****				FE
70-A2-2032		<i>Electrical System - Apparatus Body, Point to Point</i>	1	FE
70-A2-4020		Electrical System - 12 Volt Testing	1	FE
70-A2-6020		<i>12-Volt Wiring Protection - Split Loom</i>	1	FE
70-A2-8020		EMI/RFI Protection	1	FE
AUDIBLE WARNING DEVICES				FE
INTERIOR COMPARTMENT LIGHTING				FE
70-E2-2220		<i>Light - Compartment, LED Strip</i>	12	FE
There will be two-(2) lights installed in each compartment.				
70-H2-0220		Switch - Compartment Door Ajar Indicator	1	FE
72-R8-4020	S	<i>Zone C Upper Lights (2) - Red LED Beacons, Whelen B6LED B6MMRBP</i>	1	FE
L31 Beacon Color: Red				
700 Warning Color: Blue				
74-D8-8820		<i>Zone B & D Lower Midship (2) - Red/Blue w/Clear Lens M6 LED, Whelen M6J</i>	1	FE
There will be one-(1) light located on each side of the apparatus in the body wheel well area.				

PART NO	S	DESCRIPTION	QTY	ID
74-G8-1420		<p><i>Zone B & D Lower Rear (2) - Red/Blue w/Clear Lens LINZ6 LED, Whelen LINZ6J</i></p> <p>There will be one-(1) light located on each side of the apparatus below compartment L3 / R2.</p>	1	FE
74-H8-2020		<p><i>Zone C Lower Lights (2) - Red w/Clear Lens M6 LED, Whelen M6RC</i></p> <p>There will be one-(1) light located on each side of the apparatus in the rear tail light housings.</p>	1	FE
74-J4-0620		<i>Stop/Turn/Reverse Lights - LED, Whelen M6</i>	1	FE
74-J4-2620		<i>Housing - Rear Tail Light Assembly, M6FCV4</i>	1	FE
		12-VOLT APPARATUS LIGHTING / ACCESSORIES		FE
74-L0-2220		Lights - LED Clearance and Marker	1	FE
74-L2-0420		<p><i>Light - LED Underbody</i></p> <p>Make / Model: Luma Bar H20 AY-9500-012</p> <p>Locations: Under all cab doors (Invader chassis includes pre-wire provisions), under both pump panels, beneath L3 and R2, and two (2) under the tail board</p> <p>The lights shall be controlled by a switch in the cab or when the parking brake is set.</p>	10	FE
74-L2-4020		Light - LED License	1	FE
74-L2-4420		<p><i>Light - LED Perimeter Illumination</i></p> <p>Make / Model: Whelen OS Series 0SC0EDCR</p> <p>The lights will be located along the front bulkhead of the hose bed as high as possible.</p> <p>The lights will be controlled by a rocker switch on the left rear of the apparatus next to the rear scene light switch.</p>	3	FE
74-P2-2220	U	<p><i>Light - Single Pioneer LED Scene, Whelen Pioneer Plus PCPSM1C</i></p> <p>The light will be located on upper left rear of the body.</p>	1	
74-P4-0220		<p><i>Switch - Additional, Scene Light Activation</i></p> <p>In addition to the reverse circuit and dash mounted switch, the rear scene light shall be controlled by a switch on the left rear of the apparatus next to the hose bed light switch.</p>	1	FE
74-P4-6420		<i>Upper Rear Scene Light Activation - Reverse Circuit</i>	1	FE
74-S8-0420		<p><i>Switch - Telescoping Light Activation, Pump Panel</i></p> <p>There will be two-(2) switches on the left pump panel to control the respective side telescoping light.</p>	2	FE
		== Paint - Extruded Bodies - 1022.001 10/01/22 ==		FE

PART NO	S	DESCRIPTION	QTY	ID
80-C2-0230		Paint - Body	1	FE
80-C2-0420		Paint Color/Code: Red FLNA 31979 (FFA Red 1)	1	FE
80-D2-1220		Interior Compartment Finish - Natural	1	FE
80-E2-2020		NFPA Striping - Customer / Dealer Supplied	1	FE
80-E8-0220		Striping - Rear Body, Reflective Chevron	1	FE
80-E8-0620		Chevron Striping Colors: 3M Red & Lime Green	1	FE
80-E8-4020		Reflective Material - Designated Walking Surfaces	1	FE
80-G2-0820		Lettering Package - Customer / Dealer Supplied	1	FE
		== Warranty / Manuals - Pumpers Custom - 1022.001 10/01/22 ==		FE
98-A2-0420		Warranty - Body Material & Workmanship, 2-Year / 36,000 Miles (RFW0002)	1	FE
98-A4-0420		Warranty - Body Structure, 10-Year / 100,000 Miles (Aluminum - RFW0502)	1	FE
98-A6-0220		Warranty - Body Paint / Perforation, 10 Year (RFW0710)	1	FE
98-A8-6020		Warranty - Hale Pumps	1	FE
98-A8-8020		Warranty - Plumbing System, 10-Year / 100,000 Miles (RFW0801)	1	FE
98-A8-8420		Warranty - Poly Water Tank, Lifetime	1	FE
98-B2-1820		Manuals - Apparatus Body & Components	1	FE
98-B2-2020		Manuals - Pump	1	FE
98-B2-2220		Safety Guide - FAMA	1	FE
98-B2-6620		Wiring Diagrams - Apparatus Body, Standard	1	FE
		== Loose Equipment Pkg. - Pumper - 1022.001 10/01/22 ==		FE
90-A2-0220		Equipment Package - NFPA 1901 2016, Fire Department Supplied	1	FE
		The loose equipment as outlined in NFPA 1901, 2016 edition, section 5.9 thru 5.9.4 shall be provided by the fire department unless it is listed in this proposal. All loose equipment shall be installed on the apparatus before placed in emergency service, unless the Fire Department authorized agent signs the State of Exception as listed in the NFPA 1901 Standard for Automotive Fire Apparatus sections 4.21 thru 4.21.2.		
90-C2-0420		Ladder - 10' Folding Attic, Alco-Lite FL-10	1	FE
90-C6-0420		Ladder - 14' Roof, Alco-Lite PRL-14	1	FE
90-D6-1020		Ladder - 24' 2-Section Extension, Alco-Lite PEL-24	1	FE
90-G4-1020		Bracket - Attic Ladder Right Side, Ziamatic FLBA (Alco-Lite)	1	FE
96-C2-0220		Wheel Chocs (2) - Folding, Ziamatic SAC-44-E	1	FE
96-C2-0420		Holders (2) - Wheel Chocs, Ziamatic SQCH-44-H	1	FE
		The holder will located below compartment L1.		

Invader

Ferrara Fire Apparatus
27855 James Chapel Road
Holden, LA 70744

Prepared By : ERIC ADAMS
800-443-9006
eadams@revgroup.com

Prepared For : MARC MAZZA
BULLDOG FIRE APPARATUS

Wednesday, October 18, 2023 12:26:11 PM CDT

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Prepared By ERIC ADAMS
 Quote Id : QA4FPPFBM,Revision Level: -3
 Phone : 800-443-9006
 Order Id:
 Lead Unit Order Id:

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Sales Order Number: QA4FPPFBM
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Quotation

	Description	Qty.
VEHICLE		
MODEL	Invader	1
CUSTOMERS / OEMS	Ferrara Fire Apparatus (11150)[1000016]	1
MODEL YEAR	Model Year - 2025	1
COUNTRY OF SERVICE	Country of Service United States Of America	1
CAB AND CHASSIS LABELING LANGUAGE	Cab and Chassis Labeling Language English w/Innovative Controls Labels	1
APPARATUS TYPE	Apparatus Type Pumper	1
VEHICLE TYPE	Vehicle Type Straight Truck	1
VEHICLE ANGLE OF APPROACH PACKAGE	Vehicle Angle of Approach NFPA Minimum 8.00 Degrees	1
AXLE CONFIGURATION	Axle Configuration 4x2 (Rear Axle Drive Only)	1
GROSS AXLE WEIGHT RATINGS FRONT	GAWR Front 20000#	1
GROSS AXLE WEIGHT RATINGS REAR	GAWR Rear 27000#	1
PUMP PROVISION	Pump Provision Driveline Midship, Pump Mode Prog w/Auto Park Brake "N"	1
WATER & FOAM TANK CAPACITY	Water & Foam Tank Capacity 750 to 1250 Gallons	1
CAB		
CAB STYLE	Cab Style EMFD 10" Raised Roof	1
CAB FRONT FASCIA	Cab Frt Fascia Classic w/Quad Headlight Bezels	1
FRONT GRILLE	Cab Frt Grille Ferrara	1
CAB UNDERCOAT	Cab Undercoat	1
CAB SIDE DRIP RAIL	Cab Side Drip Rail	1
CAB PAINT EXTERIOR	Cab Paint Exterior Single Color	1
CAB PAINT PROCESS/MANUFACTURER	Cab Paint Process/Manufacturer Sikkens	1
CAB PAINT PRIMARY/LOWER COLOR	Cab Paint Primary/Lower Color Sikkens Red FLNA 31979	1
CAB PAINT WARRANTY	Cab Paint Warranty (10) Year RFW0710	1
CAB PAINT INTERIOR	Cab Paint Int Multi-tone Onyx Blk	1
CAB ENTRY DOORS	Cab Entry Doors (4)	1
CAB ENTRY DOOR TYPE	Cab Entry Door Type Full Length w/Pollak Switches	1
CAB INSULATION	Cab Insulation Nonwoven Polyester Fiber	1
CAB STRUCTURAL WARRANTY	Cab Structural Warranty (10) Year RFW0602	1
CAB TEST INFORMATION	Cab Test Information Crash Test ECE-R29/SAE J2420/SAE J2422	1
ELECTRICAL POWER DISTRIBUTION		
ELECTRICAL SYSTEM	Elec System 12V DC Multiplex	1
APPARATUS WIRING PROVISION	Apparatus Wiring Provision (8) Circuit Panel	1
VEHICLE DISPLAY	Vehicle Display Weldon Vista LH Sw Pnl	1
LOAD MANAGEMENT SYSTEM	Load Management System Multiplex	1

DATA RECORDING SYSTEM	Data Recording Sys Vehicle Data Weldon MUX	1
ACCESSORY POWER	Accessory Pwr & Gnd Stud 40A Batt Dir & 15A Ign Sw & 225A Batt Dir OEM Conn	1
AUXILIARY ACCESSORY POWER	Aux Acc Pwr 6 Fuse Blue Sea Pnl Bhd Drv Seat w/40A Fuse Batt Dir	1
EXTERIOR ELECTRICAL TERMINAL COATING	Exterior Electrical Terminal Coating Spray On Plasti Dip	1
ELECTRICAL SYSTEM WARRANTY	Electrical System Warranty (2) Year RFW0202	1

ENGINE

ENGINE	Engine Diesel 450HP Cummins L9 - EPA 2021-26	1
CAB ENGINE TUNNEL	Cab Engine Tunnel Small/Medium	1
DIESEL PARTICULATE FILTER CONTROLS	DPF Ctrl Regeneration Sw & Inhibit Sw	1
ENGINE PROGRAMMING HIGH IDLE SPEED	Engine Programming High Idle Speed 1250 RPM	1
ENGINE HIGH IDLE CONTROL	Engine High Idle Ctrl Manual and Automatic w/Disp Actv	1
ENGINE PROGRAMMING ROAD SPEED GOVERNOR	Engine Programming Road Speed Governor Enabled	1
AUXILIARY ENGINE BRAKE	Aux Engine Brake Compression Brake w/VG Turbo	1
AUXILIARY ENGINE BRAKE CONTROL	Aux Engine Brake Ctrl Off/Low/Med/High Disp	1
ELECTRONIC ENGINE OIL LEVEL INDICATOR	Elec Engine Oil Level Indicator	1
FLUID FILLS	Fluid Fills Under Cab	1
ENGINE DRAIN PLUG	Engine Drain Plug	1
ENGINE WARRANTY	Engine Warranty Cummins (5) Year/100,000 Miles	1
REMOTE THROTTLE HARNESS	Rmt Throttle Harness Cab Harness Only Shift Interlock	1
ENGINE PROGRAMMING REMOTE THROTTLE	Engine Program Rmt Throttle Off	1
ENGINE PROGRAMMING IDLE SPEED	Engine Programming Idle Speed 700 RPM	1

AIR INTAKE

ENGINE AIR INTAKE	Engine Air Intake Filtration and Restriction w/Replaceable Element Abv Radiator	1
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COOLING

ENGINE FAN DRIVE	Engine Fan Drive Variable Speed Engaged in Pump Mode	1
ENGINE COOLING SYSTEM	Engine Cooling System Serial Flow w/Package Drop-Out Prov	1
ENGINE COOLING SYSTEM PROTECTION	Engine Cooling System Protection Light Duty Skid Plate Paint Frame Color	1
ENGINE COOLANT	Engine Coolant Extended Life	1
ELECTRONIC COOLANT LEVEL INDICATOR	Elec Low Coolant Level Indicator	1
ENGINE PUMP HEAT EXCHANGER	Engine Pump Heat Exchanger	1
COOLANT HOSES	Coolant Hoses Silicone	1
ENGINE COOLANT OVERFLOW BOTTLE	Engine Coolant Overflow Expansion Bottle	1

EXHAUST

ENGINE EXHAUST SYSTEM	Eng Exhaust Sys Under Frm RH Single Module Aftertreatment Outboard	1
DIESEL EXHAUST FLUID TANK	Diesel Exhaust Fluid Tank LH 6 Gal Fill Thru Rr Step	1
ENGINE EXHAUST ACCESSORIES	Engine Exhaust Acc Temp Mitigation	1
ENGINE EXHAUST WRAP	Engine Exhaust Wrap	1
EMISSIONS SYSTEM WARRANTY	Emissions System Warranty (5) Year/100,000 Miles RFW0140	1

TRANSMISSION

TRANSMISSION	Transmission Allison 3000 EVS	1
TRANSMISSION MODE PROGRAMMING	Transmission Mode Programming 5th Startup/6th Mode	1
TRANSMISSION FEATURE PROGRAMMING	Transmission Feature Programming Allison Gen 5 & 6-E I/O Package 198/Pumper	1
TRANSMISSION SHIFT SELECTOR	Transmission GEN 5 & 6-E Shift Sel Key Pad/Push Button	1
ELECTRONIC TRANSMISSION OIL LEVEL INDICATOR	Elec Transmission Oil Level Indicator	1
TRANSMISSION PRE-SELECT WITH AUXILIARY BRAKE	2nd Gear Pre-Select	1
TRANSMISSION COOLING SYSTEM	Transmission Cooling System	1
TRANSMISSION DRAIN PLUG	Transmission Drain Plug	1
TRANSMISSION WARRANTY	Transmission Warranty Allison (5) Year	1

POWER TAKE OFF

PTO LOCATION	PTO Location 8:00/4:00	1
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DRIVELINE

DRIVELINE	Driveline MSI 1710 w/Meritor U-Joints w/Thrust Washers	1
MIDSHIP PUMP / GEARBOX	Midship Pump Jackshaft Only	1
MIDSHIP PUMP / GEARBOX MODEL	Midship Pump/Gearbox Model Hale QMAX Fwd	1
MIDSHIP PUMP GEARBOX DROP	Midship Driveline Pump Gearbox Drop Hale "LG"	1
MIDSHIP PUMP RATIO	Midship Pump Ratio 2.28:1 (23)	1
MIDSHIP PUMP LOCATION C/L SUCTION TO C/L REAR AXLE	Midship Pump Location C/L Suction to C/L Rear Axle 96.0"	1
PUMP SHIFT CONTROLS	Pump Shift Ctrl Air Ctrl Integrated Shifter Pod	1
PUMP SHIFT CONTROL PLUMBING	Pump Shift Control Plumbing Pre-Plumb Elec/Air	1

FUEL SYSTEMS

FUEL FILTER/WATER SEPARATOR	Fuel Filter/Wtr Separator Fleetguard FS20121 w/Lt & Alarm	1
FUEL LINES	Fuel Lines Wire Braid	1
FUEL SHUTOFF VALVE	Fuel Shutoff Valve (2) at Primary Filter	1
ELECTRIC FUEL PRIMER	Electric Fuel Primer Engine Sply Electric Lift Pump	1
FUEL TANK	Fuel Tank 50 Gallon	1
FUEL TANK MATERIAL AND FINISH	Fuel Tank Material Steel & Finish Bedliner	1
FUEL TANK STRAP MATERIAL AND	Fuel Tank Strap Material SS & Finish Painted Frame Components Color	1

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FINISH

FUEL TANK FILL PORT	Fuel Tank Fill Port LH Rwd/RH Mid	1
FUEL TANK SERVICEABILITY PROVISIONS	Fuel Tank Serviceability Prov 8' Fuel Line Extension	1
FUEL TANK DRAIN PLUG	Fuel Tank Drain Plug Magnetic	1

FRONT AXLE

FRONT AXLE	Frt Axle Meritor MFS 20000# Beam	1
FRONT AXLE WARRANTY	Front Axle Warranty Meritor 2025	1
FRONT WHEEL BEARING LUBRICATION	Frt Wheel Bearing Lube Oil	1

FRONT SUSPENSION

FRONT SHOCK ABSORBERS	Frt Shock Absorbers Bilstein	1
FRONT SUSPENSION	Frt Suspension 10 Leaf 20000-21500#	1

STEERING

STEERING COLUMN/WHEEL	Steering Column/Wheel Tilt/Telescopic 18" 4 Spoke	1
ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR	Elec Power Steering Fluid Level Indicator	1
POWER STEERING PUMP	Power Steering Pump TRW w/Passive Cooler	1
FRONT AXLE CRAMP ANGLE	Front Axle Cramp Angle 48L/44R Degrees	1
POWER STEERING GEAR	Power Steering Gear TRW TAS 65 w/Assist	1
CHASSIS ALIGNMENT	Chassis Alignment	1

REAR AXLE

REAR AXLE	Rear Axle 27000# Meritor RS-25-160	1
REAR AXLE DIFFERENTIAL LUBRICATION	Rear Axle Differential Lubrication Oil	1
REAR AXLE WARRANTY	Rear Axle Warranty Meritor 2025	1
REAR WHEEL BEARING LUBRICATION	Rear Wheel Bearing Lubrication Oil	1
VEHICLE TOP SPEED	Vehicle Top Speed 68 MPH	1
REAR AXLE EXTERNAL VENT	Rear Axle External Vent OEM Housing Breather	1

REAR SUSPENSION

REAR SUSPENSION	Rear Susp Reyco 79KB 27000# Parabolic 4 Leaf w/Helper	1
REAR SHOCK ABSORBERS	Rear Shock Absorbers Bilstein	1

TIRES

TIRE INTERMITTENT SERVICE RATING	Tire Intermittent Service Ratings Acceptable	1
FRONT TIRE	Frt Tire 315/80R 22.5 Michelin XZUS 2	2
REAR TIRE	Rear Tire 12R 22.5 Michelin XDN2	4
REAR AXLE RATIO	Rear Axle Ratio 5.38	1
TIRE PRESSURE INDICATOR	Tire Pressure Ind Frt & Rr LED	1

WHEELS

FRONT WHEEL	Frnt Wheel Alcoa 22.5 x 9.00 Alum	2
REAR WHEEL	Rr Whl Alcoa 22.5 x 8.25 Alum	4

BRAKES

BRAKE SYSTEM	Brake System ABS/ATC/ESC Sgl Axle	1
FRONT BRAKES	Frnt Brakes Meritor EX225 Disc 17"	1
REAR BRAKES	Rr Brakes Meritor EX225 Disc 17"	1
PARK BRAKE	Prk Brake Rr Wheels Only	1
PARK BRAKE CONTROL	Prk Brake Ctrl LH Tunnel Mnt, Integrated w/Shift Pod, Adjacent To Trans Shifter	1
AIR DRYER	Air Dryer Wabco System Saver 1200 Bhd LH Batt Box	1
FRONT BRAKE CHAMBERS	Frnt Brake Chambers MGM Type 24 Long Stroke	1
REAR BRAKE CHAMBERS	Rr Brake Chambers TSE 24/30 H.O.T.	1

AIR SUPPLY SYSTEMS

AIR COMPRESSOR	Air Compressor Wabco SS318 18.7 CFM	1
AIR GOVERNOR	Air Governor Mnt on Air Dryer Bracket	1
MOISTURE EJECTORS	Moisture Ejectors w/Cable/Auto Htd Wet Tank w/Cable	1
AIR SUPPLY LINES	Air Sply Lines Nylon w/PTC Fittings	1
REAR AIR TANK MOUNTING	Rear Air Tank Mnt Any Bhd Rear Axle Perpendicular w/Frame	1

FRAME

WHEELBASE	Wheelbase 186.0"	1
REAR OVERHANG	Rear Overhang 52.0"	1
FRAME	Frame Double Channel 35.00" Width	1
FRAME PAINT	Frame Paint Hot Dipped Galvanized - Frame Only Addl Comp Blk Powder Coat	1
FRAME ASSEMBLY STRUCTURAL WARRANTY	Frame Assembly Structural Warranty (50) Year RFW0305	1
FRAME RAIL CORROSION WARRANTY	Frame Rail Corrosion Warranty (25) Year RFW0316	1
FRAME COMPONENTS CORROSION WARRANTY	Frame Components Corrosion Warranty (3) Year RFW0315	1

BUMPER

FRONT BUMPER	Frnt Bumper Structural Steel Channel Severe Duty w/Recessed LH Outboard Provision	1
FRONT BUMPER EXTENSION LENGTH	Frnt Bumper Extension Length 21"	1
FRONT BUMPER PAINT	Frnt Bumper Paint Primary/Lower Cab Color w/Bedliner Black Bumper Trim	1
FRONT BUMPER TRIM	Frnt Bumper Trim SS Painted Band Frnt Top Edge & Corners Below Apron	1
FRONT BUMPER SUCTION PROVISION	Frnt Bumper Suction Provision 5.0" RH Vertical Outboard	1
FRONT BUMPER APRON	Frnt Bumper Apron For 21" Extension	1
FRONT BUMPER DISCHARGE	Front Bumper Discharge 2.0" LH Frame Mnt Plumbing	1

FRONT BUMPER COMPARTMENT CENTER	Frnt Bumper Cmpt Ctr w/Seat Belt Straps	1
MECHANICAL SIREN	Mechanical Siren Federal Signal Q2B Recess Mnt	1
MECHANICAL SIREN LOCATION	Mech Siren Location Frt Bmpr Face LH OB Fully Recessed	1
AIR HORN	Air Horn (2) 21" Round Hadley E-Tone	1
AIR HORN LOCATION	Air Horn Location (2) Frt Bmpr Face Ctr R/L OB	1
AIR HORN RESERVOIR	Air Horn Reservoir (1) 1200 Cu In	1
ELECTRONIC SIREN SPEAKER	Elect Siren Speaker 100W Cast Products SA2401	1
ELECTRONIC SIREN SPEAKER LOCATION	Elec Siren Speaker Location Frt Bmpr Face RH OB	1
FRONT BUMPER TOW HOOKS	Frnt Bumper Tow Hooks Painted Below Fwd	1

CAB TILT

CAB TILT SYSTEM	Cab Tilt System	1
CAB TILT AUXILIARY PUMP	Cab Tilt Aux Pump Manual Mnt w/Tilt Pump	1
CAB TILT LIMIT SWITCH	Cab Tilt Limit Sw Preset Limit	1
CAB TILT ALARM	Cab Tilt Alarm	1
CAB TILT CONTROL RECEPTACLE	Cab Tilt Ctrl Receptacle For Customer Install In Body	1
CAB TILT LOCK DOWN INDICATOR	Cab Tilt Lock Down Indicator	1

CAB GLASS

CAB WINDSHIELD	Cab Windshield	1
GLASS FRONT DOOR	Glass Frt Dr Pwr	1
GLASS TINT FRONT DOOR	Glass Tint Frt Dr Automotive Dark Gray	1
GLASS REAR DOOR RIGHT HAND	Glass Rr Dr RH Pwr	1
GLASS TINT REAR DOOR RIGHT HAND	Glass Tint Rr Door RH Automotive Dark Gray	1
GLASS REAR DOOR LEFT HAND	Glass Rr Dr LH Pwr	1
GLASS TINT REAR DOOR LEFT HAND	Glass Tint Rr Door LH Automotive Dark Gray	1
GLASS SIDE MID RIGHT HAND	Glass Side Mid RH Fxd 16"W x 26"H	1
GLASS TINT SIDE MID RIGHT HAND	Glass Tint Side Mid RH Automotive Dark Gray	1
GLASS SIDE MID LEFT HAND	Glass Side Mid LH Fxd 16"W x 26"H	1
GLASS TINT SIDE MID LEFT HAND	Glass Tint Side Mid LH Automotive Dark Gray	1

CLIMATE CONTROL

CABIN AIR FILTRATION	Cabin Air Filtration System Active Air Pur UpR Rear Wall Horiz Ign/Shore Pwr	1
CLIMATE CONTROL	Climate Ctrl Htr Defroster A/C SGM Ovrhd Alum 10-24" RR Short Plenum	1
CLIMATE CONTROL DRAIN	Climate Control Drain Gravity	1
CLIMATE CONTROL ACTIVATION	Climate Ctrl Actv Rotary Dash Mnt Ctr	1
HVAC OVERHEAD COVER PAINT	HVAC Overhead Cover Paint Multi-tone Onyx Black	1
A/C CONDENSER LOCATION	A/C Condenser Location Roof Mnt Fwd Ctr	1
A/C COMPRESSOR	A/C Compressor TM-31/QP-31	1
UNDER CAB INSULATION	Under Cab Insulation Engine Tunnel	1

CAB INTERIOR

INTERIOR TRIM FLOOR	Interior Trim Floor	1
INTERIOR TRIM	Interior Trim Vinyl w/Painted Aluminum Side Walls	1
REAR WALL INTERIOR TRIM	Rear Wall Interior Trim Painted Aluminum	1
HEADER TRIM	Header Trim XDuty	1
TRIM CENTER DASH	Trim Center Dash XDuty w/Gas Cylinder Stay	1
TRIM LEFT HAND DASH	Trim LH Dash XDuty	1
TRIM RIGHT HAND DASH	Trim RH Dash XDuty Glove Cmpt/MDT Prov	1
ENGINE TUNNEL TRIM	Eng Tnl Trim Flr Mat	1
ENGINE TUNNEL ACCESSORIES	Eng Tnl Acc Mtg Plate w/0.75" Spacers/Full Size	1
POWER POINT DASH MOUNT	Pwr Pnt Dash Mnt Batt Dir (1) Sw Pnl/(2) Dual USB Blue Sea 2.1A Sw Pnl	1
STEP TRIM	Step Trim Grip Strut Lwr TPlt Mid	1
STEP TRIM KICKPLATE	Step Trim Kickplate Treadplate	1
UNDER CAB ACCESS DOOR	Under Cab Access Door Rear Step LH Tread Plate	1
INTERIOR DOOR TRIM	Interior Door Trim Painted	1
DOOR TRIM CUSTOMER NAMEPLATE	Door Trim Customer Nameplate	1
CAB DOOR TRIM REFLECTIVE	Cab Dr Trim Reflective Vert Stripe/12" Stop	1
INTERIOR GRAB HANDLE "A" PILLAR	Interior Grab Handle 'A' Pillar 11" Molded	1
INTERIOR GRAB HANDLE FRONT DOOR	Interior Grab Handle Frt Door Horiz 9"	1
INTERIOR GRAB HANDLE REAR DOOR	Int Grab Handle Rr Dr Alum Window Span 30" Polished	1
INTERIOR SOFT TRIM COLOR	Interior Soft Trim Color Black	1
INTERIOR TRIM SUNVISOR	Interior Trim Sunvisor Tinted	1
INTERIOR FLOOR MAT COLOR	Interior Floor Mat Color Black	1
CAB PAINT INTERIOR DOOR TRIM	Cab Paint Int Dr Trim Multi-tone Onyx Black	1
HEADER TRIM INTERIOR PAINT	Header Trim Interior Paint Multi-tone Onyx Black	1
TRIM CENTER DASH INTERIOR PAINT	Trim Center Dash Interior Paint Multi-tone Onyx Black	1
TRIM LEFT HAND DASH INTERIOR PAINT	Trim LH Dash Interior Paint Multi-tone Onyx Black	1
TRIM RIGHT HAND DASH INTERIOR PAINT	Trim RH Dash Interior Paint Multi-tone Onyx Black	1
REAR WALL INTERIOR PAINT	Rear Wall Interior Paint Multi-tone Onyx Black	1
DASH PANEL GROUP	Dash Pnl Group 3-Pnl w/Black Textured Aluminum Panels	1
SWITCHES CENTER PANEL	Switches Ctr Pnl 6 Upr LH	1
SWITCHES LEFT PANEL	Switches Left Pnl 1 Wiper	1
SWITCHES RIGHT PANEL	Switches Right Pnl 1	1

CAB SEATS

SEAT BELT WARNING	Seat Belt Warn Disp w/VDR	1
SEAT MATERIAL	Seat Material Bostrom Durawear Plus	1
SEAT COLOR	Seat Color Black/Red Seat Belts	1
SEAT BACK LOGO	Seat Back Logo FERRARA	6
SEAT DRIVER	Seat Driver Bostrom Firefighter 4-Way Air Non-ABTS	1
SEAT BACK DRIVER	Seat Back Driver Non-SCBA Non-ABTS	1

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SEAT MOUNTING DRIVER	Seat Mounting Driver	1
SEAT OFFICER	Seat Officer Bostrom Firefighter Fixed 500 Series ABTS	1
SEAT BACK OFFICER	Seat Back Officer SCBA Bostrom SecureAll w/Quick-Adjust	1
SEAT MOUNTING OFFICER	Seat Mounting Officer Rwd 2"	1
SEAT BELT ORIENTATION CREW	Seat Belt Orientation Crew Outboard Shoulder To Inboard Hip	1
SEAT REAR FACING OUTER LOCATION	RFO Location Primary Pos (2) R/L	1
SEAT CREW REAR FACING OUTER	Seat Crew RFO Bostrom Firefighter Fixed 500 Series	2
SEAT BACK REAR FACING OUTER	Seat Back RFO SCBA Bostrom SecureAll w/Quick-Adjust	2
SEAT MOUNTING REAR FACING OUTER	Seat Mounting RFO Rwd 2"	1
SEAT FORWARD FACING CENTER LOCATION	Seat FFC Location Secondary Pos (2) Ctr	1
SEAT CREW FORWARD FACING CENTER	Seat Crew FFC Bostrom Firefighter Fixed 500 Series	2
SEAT BACK FORWARD FACING CENTER	Seat Back FFC SCBA Bostrom SecureAll w/Quick-Adjust	2
SEAT FRAME FORWARD FACING	Seat Frm Fwd Fcg Dual	1
SEAT FRAME FORWARD FACING STORAGE ACCESS	Seat Frm Fwd Fcg Strg Acc Dr (2) R/L Sd	1
SEAT MOUNTING FORWARD FACING CENTER	Seat Mounting FFC 6" Apart	1
CAB FRONT UNDERSEAT STORAGE ACCESS DOOR	Cab Frt Undrst Strg Acc Dr	1
SEAT COMPARTMENT DOOR FINISH	Seat Compartment Door Finish Multi-tone Onyx Black	1

CAB EXTERIOR

WINDSHIELD WIPER SYSTEM	Windshield Wiper System	1
ELECTRONIC WINDSHIELD FLUID LEVEL INDICATOR	Electronic Windshield Fluid Level Indicator	1
CAB DOOR HARDWARE	Cab Door Hardware Chrome	1
DOOR LOCKS	Door Locks Manual	1
GRAB HANDLES	Grab Handles SS 18"	1
REARVIEW MIRRORS	Mirror Aerodynamic Retractable 613305 Rmt Htd	1
REARVIEW MIRROR HEAT SWITCH	Rearview Mirror Heat Sw Mirror Ctrl Pnl	1
TRIM REAR WALL EXTERIOR	Trim Rear Wall Exterior Treadplate	1
CAB FENDER	Cab Fender SS w/ABS Liner	1
MUD FLAPS FRONT	Mud Flaps Frt	1

START / CHARGING SYSTEMS

IGNITION	Ign Mstr Rkr Sw w/Push-Button Start	1
BATTERY	Batt (6) Group 31 Harris	1
BATTERY TRAY	Batt Tray (2) R/L Steel	1
BATTERY BOX COVER	Batt Box Cover (2) Steel w/Black Handles	1
BATTERY CABLE	Batt Cables	1
BATTERY JUMPER STUD	Batt Jumper Stud Frt LH Lwr Step w/Label	1
ALTERNATOR	Alternator Delco Remy 55SI 430A	1
STARTER MOTOR	Starter Motor Delco	1

LINE VOLTAGE ELECTRICAL POWER DISTRIBUTION

BATTERY CONDITIONER	Batt Cond Kussmaul Chief 4012 LH RFO Seat Position	1
BATTERY CONDITIONER DISPLAY	Batt Cond Display Integrated In Elec Inlet w/Digital Status Center	1
ELECTRICAL INLET LOCATION	Elec Inlet Location LH Cab Side Mid Fwd	1
ELECTRICAL INLET	Elec Inlet 120V 20A Auto Eject	1
ELECTRICAL INLET CONNECTION	Elec Inlet Conn to Batt Conditioner	1
ELECTRICAL INLET COLOR	Elec Inlet Color Yellow	1

LIGHTING

HEADLIGHTS	Headlights 4 Headlamps LED	1
HEADLIGHT LOCATION	Headlights Above Frt Warn Lts	1
FRONT TURN SIGNALS	Frt Turn Signals Whelen M6 LED	1
SIDE TURN/MARKER LIGHTS	Side Turn/Marker Lts LED Tecniq S170	1
MARKER & ICC LIGHTS	Marker & ICC Lts Face Mnt LED Tecniq S170	1
HEADLIGHT AND MARKER LIGHT ACTIVATION	Hdlt & Mrkr Lt Actv MUX/DRL	1
INTERIOR OVERHEAD LIGHTS	Interior Overhead Lts Red/Clear LED	1
INTERIOR OVERHEAD LIGHTING ACTIVATION	Int Ovrhd Lt Actv Resp Dr & MUX	1
LIGHTBAR PROVISION	Lightbar Prov Wire & Lwr Mnt Chassis Supply	1
CAB FRONT LIGHTBAR MODEL	Cab Front Lightbar Model Whelen F4N72	1
CAB FRONT LIGHTBAR	Cab Front Lightbar - Configured in 5450M Subcategory	1
FRONT LIGHTBAR LAYOUT	Cab Front Lightbar Layout	1
FRONT LIGHTBAR ORIENTATION	Front Lightbar Orientation - Standard Fwd	1
FRONT LIGHTBAR LIGHT POSITION 2	Cab Front Lightbar Position 2 - Red LH Side	1
FRONT LIGHTBAR LIGHT POSITION 4	Cab Front Lightbar Position 4 - Red	1
FRONT LIGHTBAR LIGHT POSITION 5	Cab Front Lightbar Position 5 - White	1
FRONT LIGHTBAR LIGHT POSITION 6	Cab Front Lightbar Position 6 - Red	1
FRONT LIGHTBAR LIGHT POSITION 7	Cab Front Lightbar Position 7 - Blue	1
FRONT LIGHTBAR LIGHT POSITION 8	Cab Front Lightbar Position 8 - Red	1
FRONT LIGHTBAR LIGHT POSITION 11	Cab Front Lightbar Position 11 - Red	1
FRONT LIGHTBAR LIGHT POSITION 12	Cab Front Lightbar Position 12 - Blue	1
FRONT LIGHTBAR LIGHT POSITION 13	Cab Front Lightbar Position 13 - Blue	1
FRONT LIGHTBAR LIGHT POSITION 14	Cab Front Lightbar Position 14 - White	1
FRONT LIGHTBAR LIGHT POSITION 15	Cab Front Lightbar Position 15 - Blue	1
FRONT LIGHTBAR LIGHT POSITION 17	Cab Front Lightbar Position 17 - Red RH Side	1
LIGHTBAR SWITCH	Lightbar Sw On w/Mstr Warn	1
FRONT SCENE LIGHTS	Frt Scene Lts FireTech FT-B-46-W 12V LED 46" White	1
FRONT SCENE LIGHT LOCATION	Frt Scene Lt Loc Ctr Brow Pos	1
FRONT SCENE LIGHTS ACTIVATION	Frt Scene Lts Actv Rkr Sw Pnl	1
SIDE SCENE LIGHTS	Side Scene Lts Whelen Pioneer LED 12V PCPSM1C Surface Mnt	1
SIDE SCENE LIGHT LOCATION	Side Scene Lt Loc Upper Mid Rwd 10" Roof Position	1

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SIDE SCENE ACTIVATION	Side Scene Actv Indv Sw & Resp Side Doors	1
REAR SCENE LIGHTS	Rear Scene Lts Whelen PFH2 12V LED Side Mount Push-up Pole (2)	1
REAR SCENE LIGHT LOCATION	Rr Scene Lt Loc (2) Pole Mnt Outer Rr Wall Cab Corner	1
REAR SCENE LIGHT ACTIVATION	Rear Scene Lt Actv Indv Sw MUX Labeled "Left/Right" Cab Tele Light	1
GROUND LIGHTS	Ground Lts Tecniq T44 LED	1
GROUND LIGHTING ACTIVATION	Ground Lt Actv Prk Brk, Resp Sd Dr & Disp	1
LOWER CAB STEP LIGHTS	Lwr Cab Step Lts Tecniq T44 LED	1
INTERMEDIATE STEP LIGHTS	Intermediate Step Lts Tecniq D06 LED Frt Drs	1
ENGINE COMPARTMENT LIGHT	Engine Cmpt Work Lt LED (1)	1

OPTICAL WARNING DEVICES

DO NOT MOVE APPARATUS LIGHT	Do Not Move App Lt Flashing Red Tecniq K50 LED w/Alarm	1
MASTER WARNING SWITCH	Mstr Warn Sw MUX	1
INBOARD FRONT WARNING LIGHTS	Inboard Frt Warn Lts Whelen M6 LED Chrm Bezel	1
INBOARD FRONT WARNING LIGHTS COLOR	Inboard Frt Warn Lts Color Red/Blue w/Clr Lens	1
FRONT WARNING SWITCH	Frt Warn Sw Disp	1
INTERSECTION WARNING LIGHTS	Intersection Warn Lts Whelen M6 LED	1
INTERSECTION WARNING LIGHTS COLOR	Int Warn Lts Color Red/Blue w/Clr Lens	1
INTERSECTION WARNING LIGHTS LOCATION	Intersection Warn Lts Location Bumper Tail Recess Mnt	1
SIDE AND INTERSECTION WARNING SWITCH	Side & Intersection Warn Sw Disp	1
TANK LEVEL LIGHTS	Tank Lvl Lts FRC Max Vision	1
TANK LEVEL LIGHTS ACTIVATION	Tank Lvl Lights Actv Prewire Rear of Cab	1
TANK LEVEL LIGHTS LOCATION	Tank Lvl Lights Loc Rear Cab Sides Centered	1

AUDIBLE WARNING DEVICES

SIREN CONTROL HEAD	Siren Ctrl Head Whelen 295SLSA1	1
AUDIBLE WARNING LH FOOT SWITCH	Audible Warning LH Foot Switch Siren	1
MECHANICAL SIREN FOOT SWITCH LH	Mechanical Siren Foot Switch LH Linemaster 491-S	1
MECHANICAL SIREN FOOT SWITCH LH LOCATION	Mechanical Foot Switch LH Location A-Pillar	1
MECHANICAL SIREN FOOT SWITCH LH POSITION	Mechanical Siren Foot Switch Position Outboard of Other Foot Switches	1
AUDIBLE WARNING LH FOOT SWITCH BRACKET	Audible Warn LH Ft Sw Double Brkt 30Deg TPlate	1
AIR HORN AUXILIARY ACTIVATION	Air Horn Actv LH Lanyard/PB Sw Pnl	1
MECHANICAL SIREN BRAKE/AUXILIARY ACTIVATION	Mech Siren PB Brk Sw, Siren/Brk Combo Sw	1
MECHANICAL SIREN INTERLOCK	Mechanical Siren Interlock Park Brake & Master Warn	1
BACK-UP ALARM	Back-Up Alarm Preco-Matic 1059	1

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INSTRUMENTATION

INSTRUMENTATION	Instrumentation Standard	1
BACKLIGHTING COLOR	Backlighting Color Red	1

COMMUNICATIONS SYSTEMS

RADIO	Radio Jensen WB/AM/FM/BT	1
RADIO LOCATION	Radio Overhead LH Offset Inboard	1
AM/FM ANTENNA	AM/FM Antenna LH Fwd Cab Roof	1
RADIO SPEAKERS	Radio Speakers (4) Front/Rear	1
CAMERA	Cam in View 360-HD (4) Cam Bird's Eye View System	1
CAMERA DISPLAY	Camera Display LH HD Monitor	1
COMMUNICATION ANTENNA	Comm Ant Base RH Fwd Cab Rf Chassis Sply	1
COMMUNICATION ANTENNA CABLE ROUTING	Comm Ant Cable Routing Under Rkr Sw Pnl	1
PANEL LAYOUT	Panel Layout	1

ADDITIONAL EQUIPMENT

FIRE EXTINGUISHER	Fire Extinguisher Shiplose	1
ROAD SAFETY KIT	Road Safety Kit Shiplose	1
DOOR KEYS	Door Keys for Manual Locks (4)	1

SALES ADMIN

WARRANTY	Warranty Cab and Chassis (2) Year RFW0102	1
CHASSIS OPERATION MANUAL	Chassis Operation Manual Digital Copy (2)	1
ENGINE & TRANSMISSION OPERATION MANUAL	Eng & Trans Operation Man Eng Hard Copy/Trans Digital/Eng Owner Digital	1
CAB/CHASSIS AS BUILT WIRING DIAGRAMS	Cab/Chassis As Built Wiring Diagrams Digital Copy (2)	1
SALES TERMS	Sales Terms	1

ENGINEERING

EFCM/REAR CROSSMEMBERS	End of Frame Cross Member 2.25" From EOF	1
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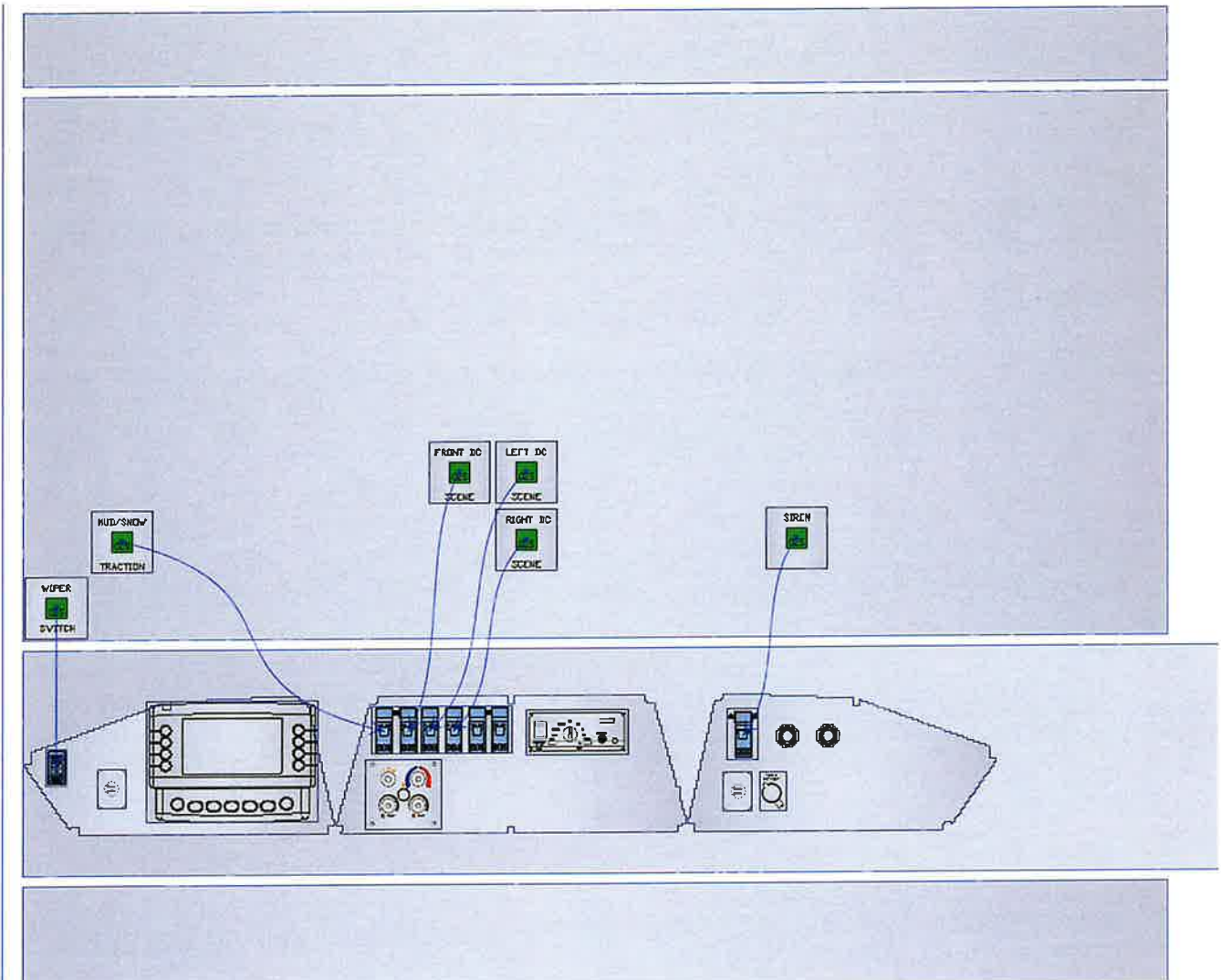
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Panel Layout

5020-002 Panel Layout



Option Description
SWITCH PANEL - MISC PANELS
LEGEND LOCATION
CLIMATE CTRLS CTR DASH ABS ROTARY SGM 94"
SW PNL 6 SW UPR LH 2010 94"
SIREN CONTROL HEAD WHELEN 295SLSA1
SWITCH PANEL RH 1 SWITCHES MOVEABLE 2010 94"
PWR POINT DASH MNT BATT DIR 10.5 W DUAL USB SW PNL
PWR POINT DASH MNT (2) BATT DIR
MECH SIREN PB BRK
AIR HORN PB 2010 94"
VEHICLE DISPLAY (1) DRIVER PNL 2010
SWITCH PANEL LH (1) WIPER SWITCH 2010 94"
DUAL USB 10.5 WATT POWER POINT DASH MNT BATT DIR (3)
FRONT SCENE LIGHT ACTIVATION ROCKER SWITCH PANEL
BRAKE SYSTEM TYPE ATC RKR SW 'MUD/SNOW TRACTION'
LEFT DC SCENE

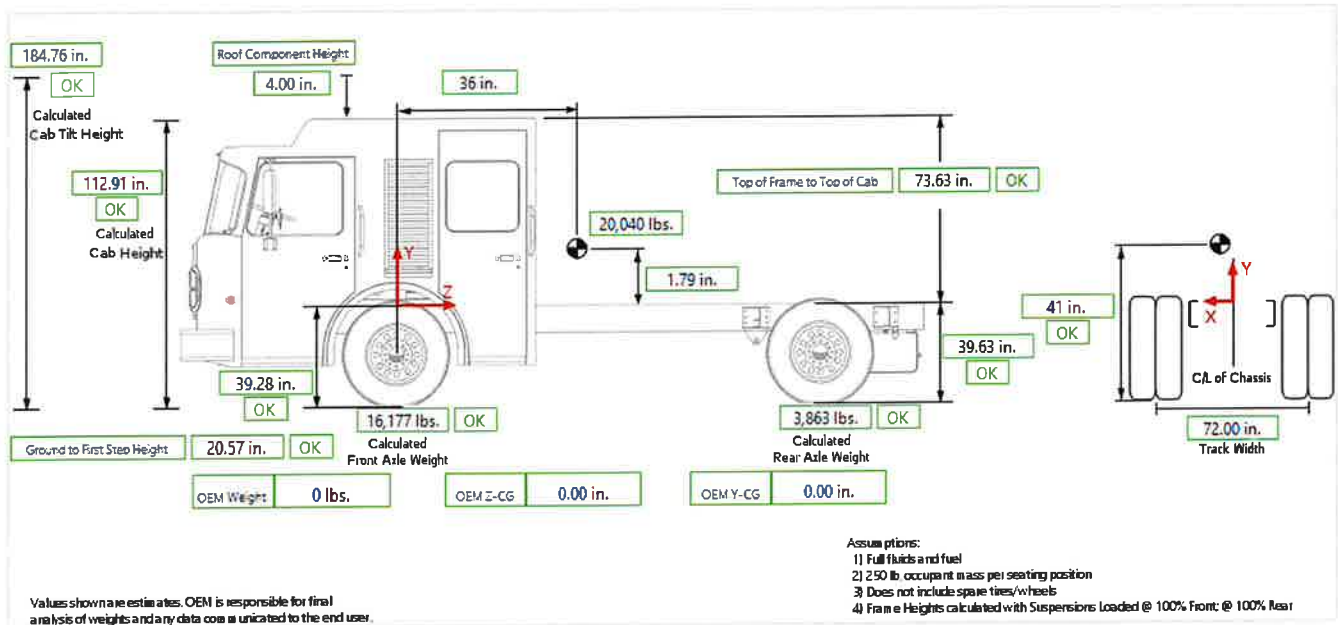
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RIGHT DC SCENE
WINDSHIELD WIPER SYSTEM SINGLE MOTOR
MECH SIREN 3 POS RKR/BRK SW

Weight Distribution



Calculated Apparatus Weight 20,040 lbs.
 Calculated Apparatus Z-CG 36 in.
 Calculated Apparatus Y-CG 1.79 in.

Note:

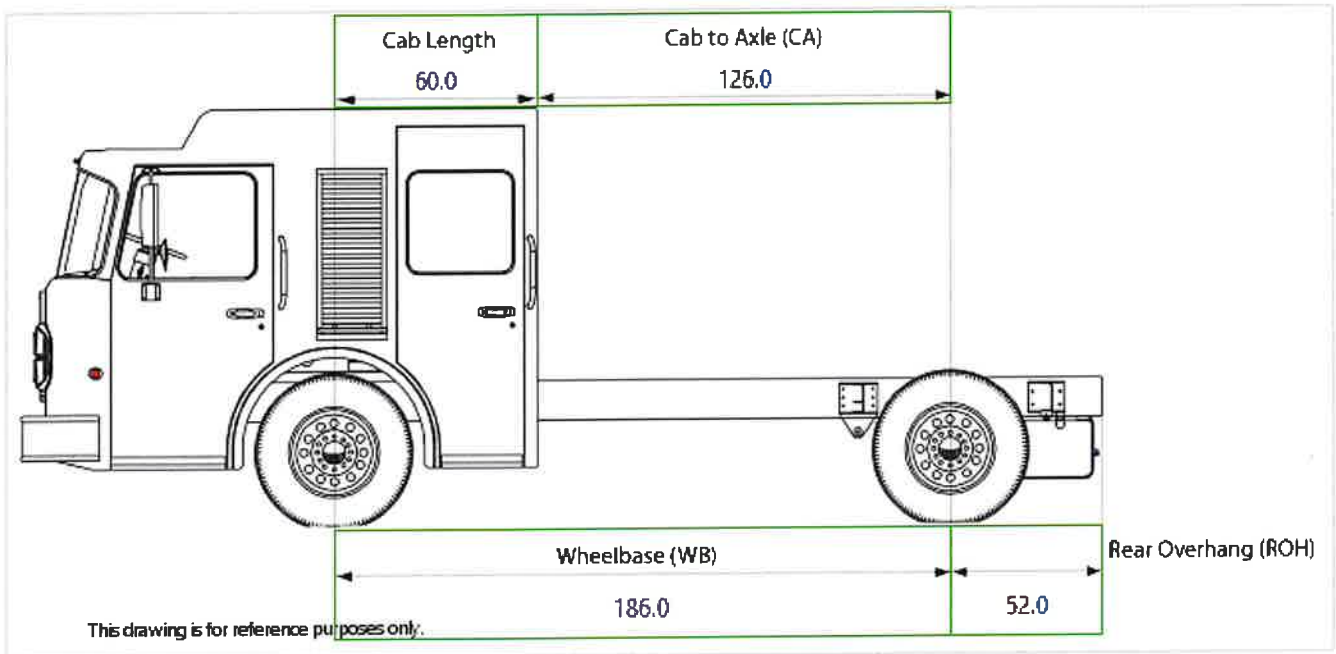
The Y-CG value above is calculated from the top of the frame.
 Apparatus refers to total combined value for cab and chassis and OEM inputs.

Seat Locations

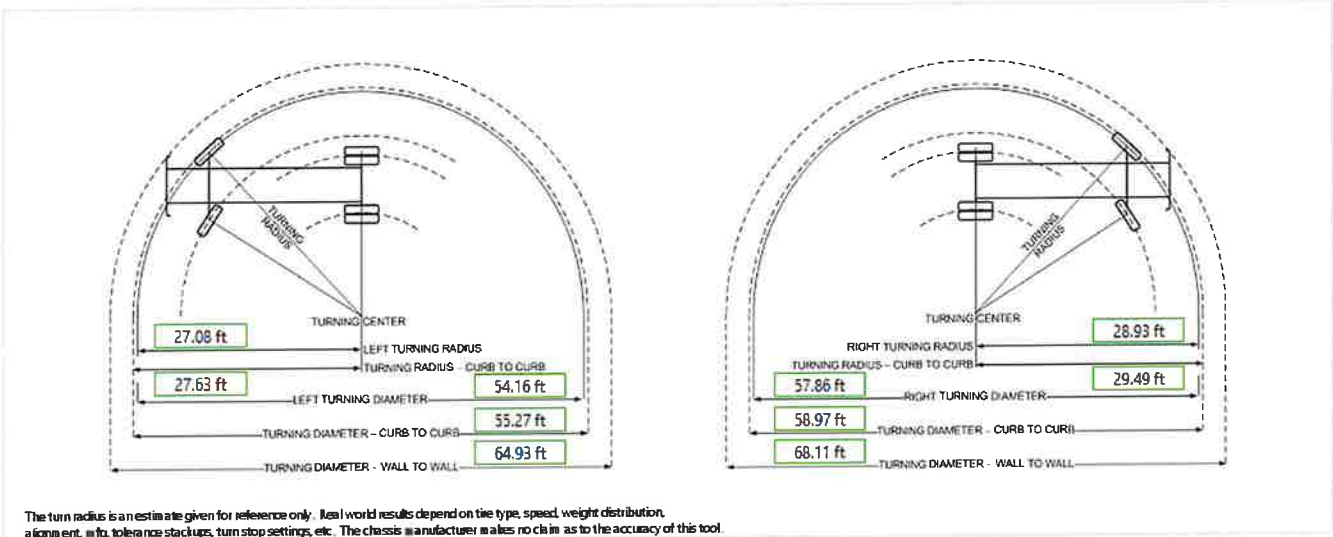


This drawing is for reference purposes only.

Frame Dimensions



Turning Radius



End User Name	Bulldog Fire Apparatus
Chassis Model	0100-011 Invader
Wheelbase	186.00 in
Bumper Extension	21.00 in
Bumper Width	99.00 in
Left hand outside tire turn angle	33.50 deg
Right hand outside tire turn angle	31.00 deg
Left hand Curb-to-Curb turning radius	27.63 ft, 8.42 m
Right hand Curb-to-Curb turning radius	29.49 ft, 8.99 m
Left hand Wall-to-Wall turning radius	32.46 ft, 9.89 m
Right hand Wall-to-Wall turning radius	34.05 ft, 10.38 m

Cab Glass

