















STABLE.

COMMITTED.



Product Review - Pierce Ascendant 107' Single Axle Aerial Ladder

What Is It?



- A single rear axle 107' rear-mounted steel aerial ladder
- Unveiled at FDIC in April 2015
- Advertised as a "HEAVY DUTY" ladder.....but is it really??



What Are They Claiming?



"THE INDUSTRY JUST CHANGED — There is Nothing Else Like This Available!"

Firematic (Pierce's NY dealer - firematic.com)

"Everyone said it couldn't be done.....
The revolution has begun."

Southcoast Fire (Pierce's CA dealer – southcoastfire.com)

Single Axle 100' Ladder





NOTHING NEW...



Local Ascendant - Review





Ascendant 107' Single Axle



Overall Height	11'-7" (up to 11'-11")
Overall Length	39'-1.5" (up to 39'-10.25")
Front Axle	22,800 lbs.
Rear Axle	33,500 lbs.
Total	56,300 lbs.
Outrigger/Jack Qty & Location	(2) Out-and-Down Ahead of Rear Axle
Outrigger Spread	18'
Ladder Material	100,000 psi steel
Minimum Wheelbase	234"
Water Tank Capacity	Up To 500 Gallons
Compartment Space (Standard Body)	149.02 Cubic Feet
Equipment Allowance	2,500 lbs.
Body Material	Formed 1/8" Aluminum (Welded)

Ascendant 107' Single Axle



Vertical Height	107' (@ 77°)
Horizontal Reach	100'
Operational Envelope	-10° to +77°
"Dead Zones"	Yes (Envelope Controls)
Tip Load (Dry)	750 lbs.
Tip Load (Wet)	500 lbs.
Equipment Allowance at Tip	100 lbs.
Aerial Device Structural Safety Factor (NFPA min = 2:1)	2:1
Wind Rating	35 MPH
Flow Rating	1500 GPM with nozzle up to 40° left or right 1000 GPM with nozzle beyond 40° Waterway rating is 1000 GPM

Available Chassis

















Rear Axle & Suspension



REAR AXLE

The rear axle will be a MeritorTM, Model RS-30-185, with a capacity of 33,500 lb.

REAR SUSPENSION

The rear suspension will be Standens, semi-elliptical, 3.00" wide x 53.00" long, 12-leaf pack with a ground rating of 33,500 lbs. The spring hangers will be castings.

The two (2) top leaves will wrap the forward spring hanger pin, and the rear of the spring will be a slipper style end that will ride in a rear slipper hanger. To reduce bending stress due to acceleration and braking, the front eye will be a berlin eye that will place the front spring pin in the horizontal plane within the main leaf.

A steel encased rubber bushing will be used in the spring eye. The steel encased rubber bushing will be maintenance free and require no lubrication.

REAR TIRES

Rear tires will be four (4) Goodyear 315/80R22.50 radials with 20 ply G289 WHA tread, rated for 36,360 lb maximum axle load and 68 mph maximum speed.

The tires will be mounted on Accuride® 22.50" x 9.00" polished aluminum disc wheels with a ten (10) stud, 11.25" bolt circle.

This is the same rear axle we use on our single axle mid-mount aerials (SA75, SL75, SP70), just with a special rating. A spring rear suspension appears to be the only option (air ride not available).



Rear Axle & Suspension



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Have only seen Goodyear G289 or G291 tread patterns utilized. Neither are an aggressive tire for mud or snow applications.

In-Service Weights

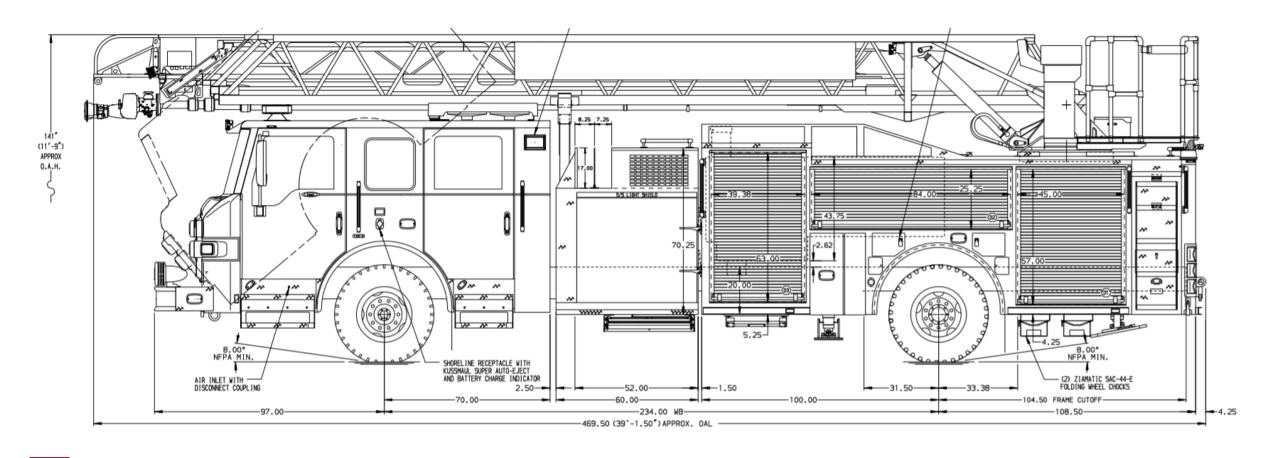




Wheelbase – 234" (Most Common) SUTPHEN



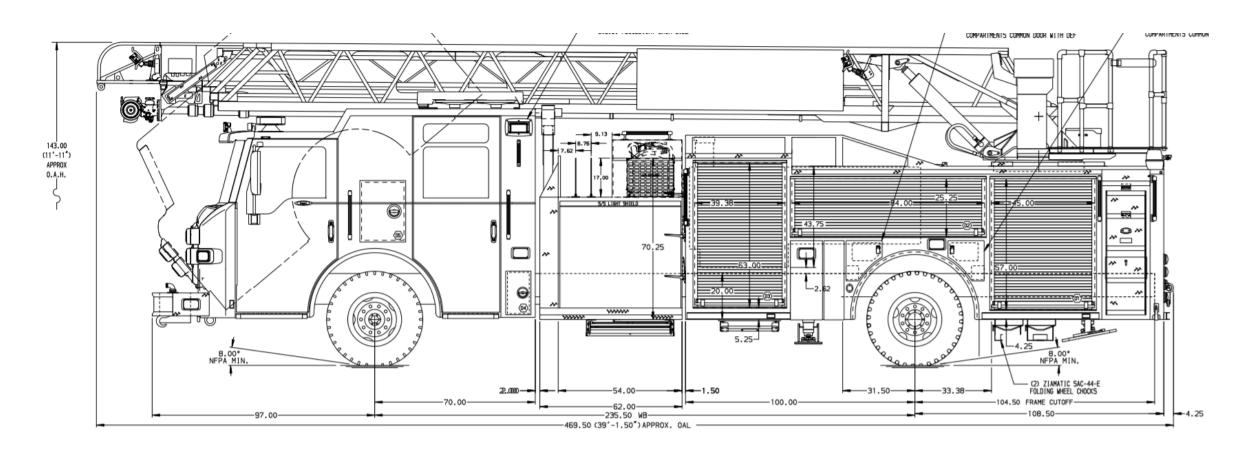
234" w/70" flat roof cab & 2 Crosslays is most common



Wheelbase - 235.5"



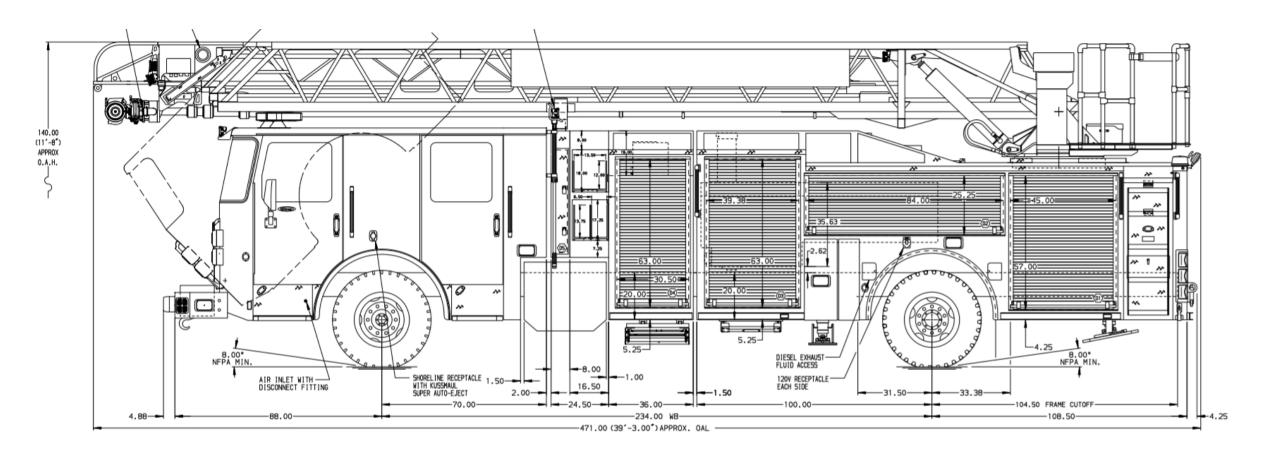
235.5" w/70" cab w/raised roof & 3 Crosslays



Wheelbase - 234" PUC



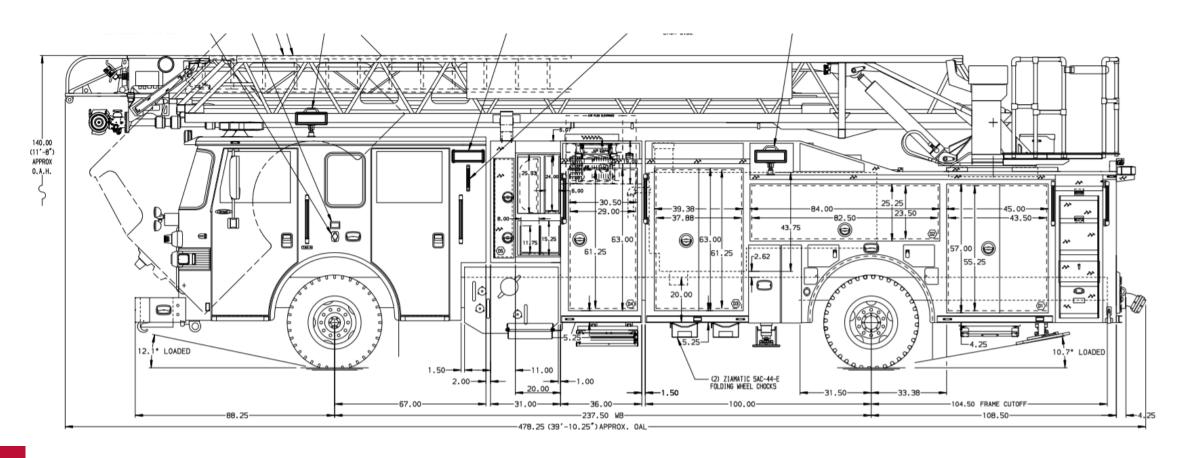
234" w/70" cab



Wheelbase - 237.5" PUC

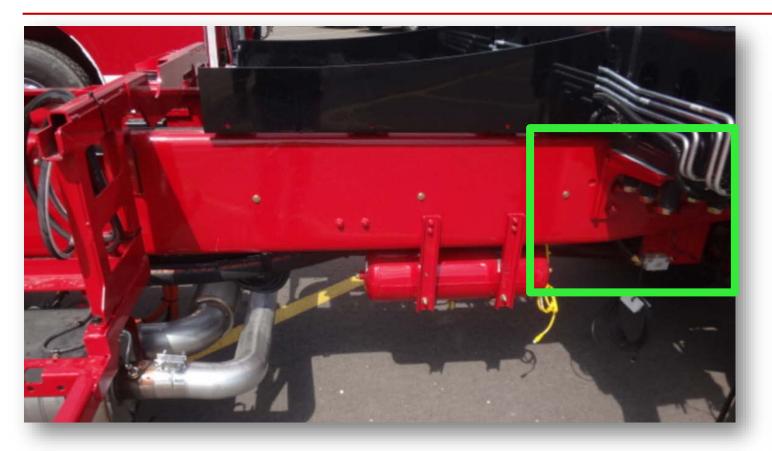


237.5" w/67" cab

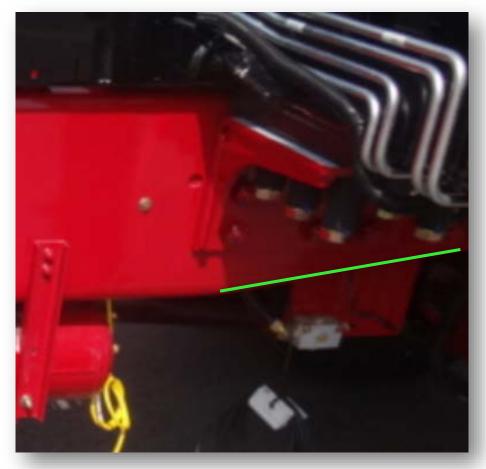


Frame Rails – 10" or 13"





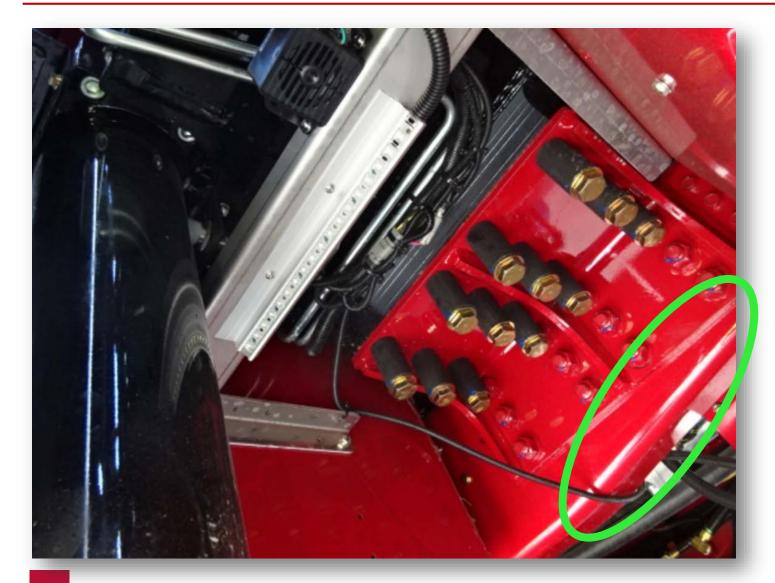
When 13" tall frame rails are specified, they are only 13" until the rear outriggers. At that point, they taper to be 10.25".

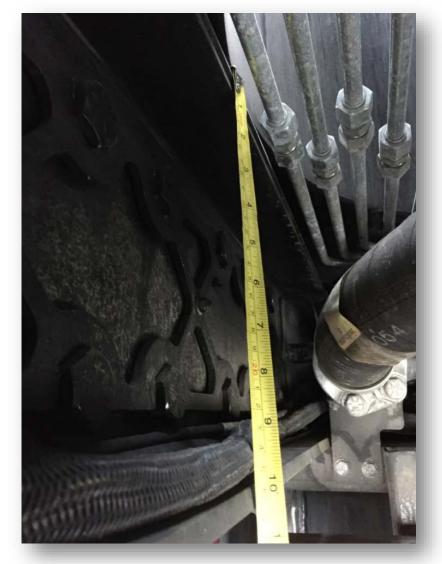


Reasoning? Weight management???

Frame Rails







Frame Rails



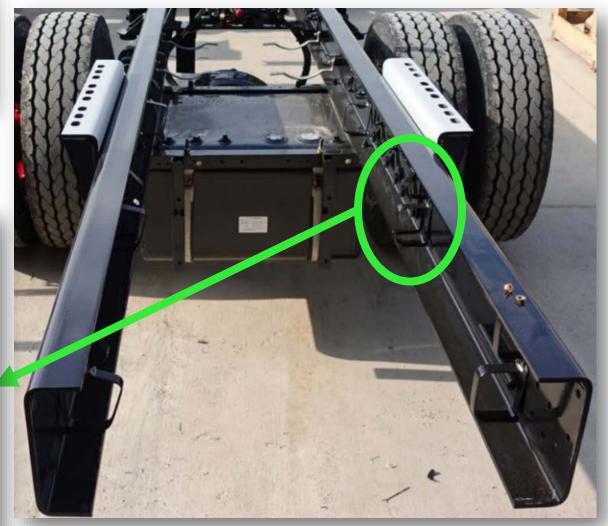
FRAME REINFORCEMENT

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

The liner will be an internal "C" design, heat-treated steel measuring 9.38" x 3.13" x 0.25". Each reinforcement member will have a section modulus of 3.90 cubic inches, yield strength of 120,000 psi and resisting bending moment (rbm) of 938,762 in-lb.

They claim they run it full length, but it stops short behind the rear axle. The inner liner is also only $\frac{1}{4}$ " thick to reduce weight.





Frame Rails - Sutphen





All Sutphen rear-mount aerial apparatus use Domex steel chassis frame rails with a true full-length 3/8" thick inner liner for strength.

Outriggers





STABILIZERS

The vehicle will come equipped with an out and down stabilization system. The system will consist of two (2) hydraulically operated out and down style stabilizers mounted above the frame and a rear stabilizer jack that is attached directly to the center rear of the torque box.



Outriggers







Notice the lightening holes in the top and sides of the outriggers.

Outrigger Spread





Fully Deployed Outrigger Spread = 18'



Short Jacked Outrigger Spread = 13'

Outriggers/Set Up



will lock out the truck. In speaking with one of the local Ascendant owners, they said it is pretty easy to make it

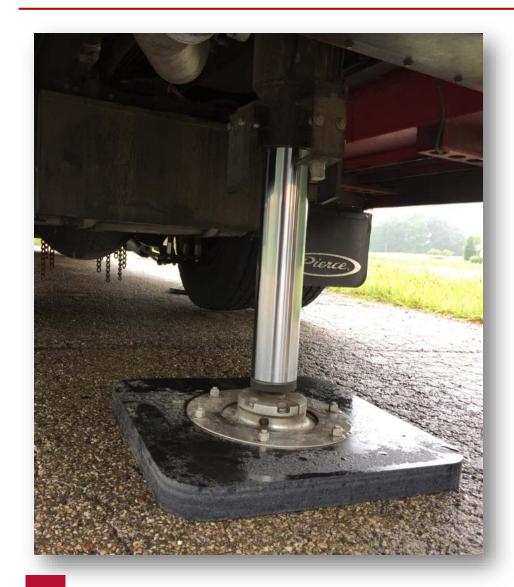
come up off the ground during normal operations.



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Rear Downrigger







The pad is built into the bottom of the rear downrigger. Notice how the downrigger stows at an angle to improve angle of departure, but yet still hangs down. This could be an expensive repair if hit just right.

Ascendant 107' Single Axle



If the truck is set up on terrain that won't allow the rear axle to be fully lifted off of the ground when the outriggers are fully extended, the aerial will have limited horizontal reach.

Also, if the truck is leveled when set up and the front tires come off the ground, the aerial will have limited reach over the front of the apparatus.

NOTE: The system will monitor the position of the front jack cylinders. When "Firm on Ground" is detected, the system knows if it can extend the front jack cylinders the additional 6 inches needed to raise the rear axle off the ground.

The center rear jack cylinder cannot be moved until both front stabilizer on-ground indicators are illuminated without flashing.

If the rear axle has not been lifted off the ground but all three jack cylinders have established a "Firm on Ground" set up with the front stabilizers fully extended, the ladder will be allowed to operate with limited horizontal reach. The reach will be limited when operating over the side of the apparatus.

For full aerial reach over the front of the truck, the front tires must remain in firm contact with the ground. Setting the truck up with the front tires off the ground will result in limited reach over the front of the truck.

Outrigger Setup Controls





Outrigger Controls – Level Assist



4-3.7 Level Assist

NOTE: Your apparatus may be equipped with a Level Assist feature.

4-3.7a Level Assist for Three Stabilizer System

- 1. To use Level Assist, lower the front stabilizers on both sides of the apparatus until the on-ground indicators begin to flash.
- Engage the Level Assist switch to have the Command Zone system bring the apparatus into a near-level condition. The rear axle will be off the ground and the on-ground indicators will be illuminated without flashing.
- 3. Check display for error message. If there is insufficient travel to level the apparatus, the alarm will sound and the on-ground indicators will continue to flash. Reposition apparatus or add cribbing or blocking and repeat leveling procedure.
- 4. Lower the center downrigger until the on-ground indicator is illuminated without flashing.

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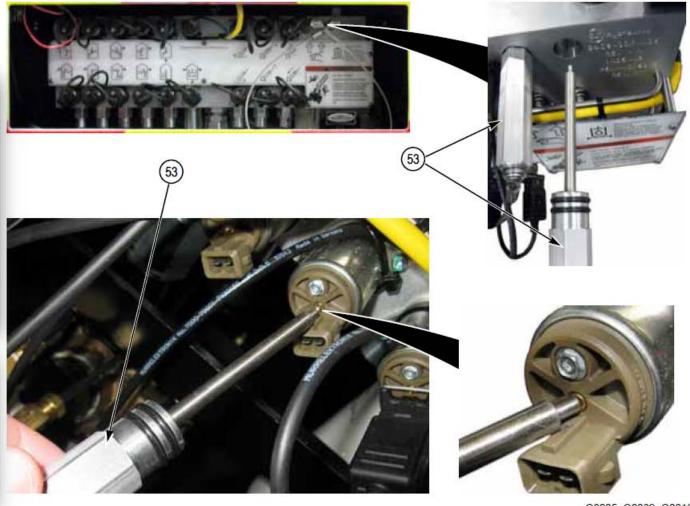
Manual Override



Figure 2-9: Manual Stabilizer and Aerial Override Controls



- The manual override control valves are located behind an access door at the rear of the truck
- Both Stabilizer and Aerial manual override valves are operated the same way.
- Electrical connector may be removed from manual control valve for easier access to activate override button.
- There are two manual override tools stored into the manual override control valve manifold.
- Push in and depress button on manual override control valve with tip of manual override tool. Continue depressing button until desired function is completed. Release button.



G0005, G0039, G0018, G0020

Body

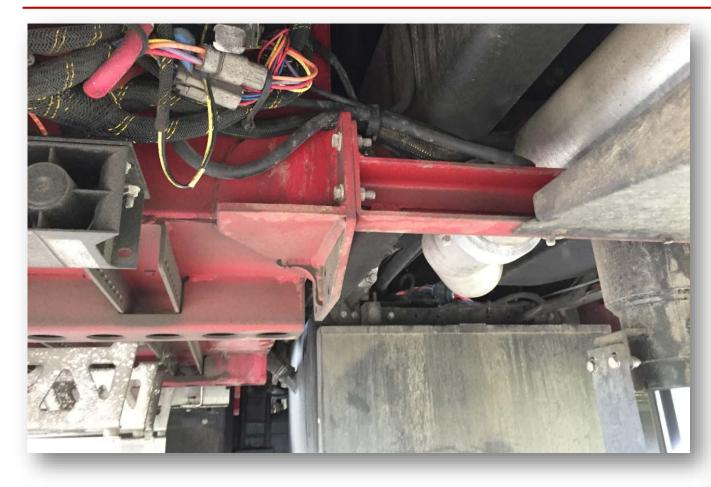




To reduce weight, they are using a self-supporting aluminum body (mostly just formed 1/8" sheet with some extrusions) that is attached to the torque box in only 3 places. There is no dedicated substructure to support the body.

Body







Body





Notice the formed body compartment support members with lightening holes.



Body Attachment

SUTPHEN

UNDERBODY SUPPORT SYSTEM

The backbone of the body support system will begin with the aerial torque box which is the strongest component of the apparatus and is designed for sustaining maximum loads.

An aluminum body structure will be mounted to the aerial torque box at three (3) points to create a floating substructure which will result in an 800 lb equipment support rating per lower compartment and provide up to .31" accumulative floor thickness.

The three (3) point body mounting system will consist of two (2) points in the front and one (1) in the rear. The front mounts will attach to the top of the stabilizer H-box, and the rear mount will attach to the rear of the torque box at the chassis centerline.

The body structure will be mounted with neoprene elastomer isolators. These isolators will have a broad load range, proven viability in vehicular applications, be of a fail-safe design and allow for all necessary movement in three (3) transitional and rotational modes.

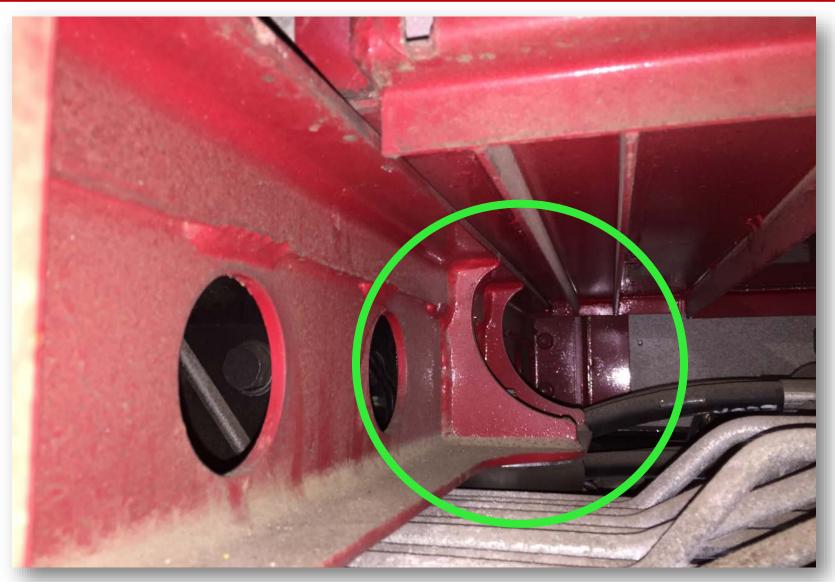
The combination of the three (3) point mounting system and elastomer isolators allow the chassis and torque box to flex without driving loads into the body.





Body Attachment (Rear)





Compartment Space





At the FDIC 2015 unveiling of the Ascendant, they claimed the truck on display had over 170 cubic feet of compartment space. They must be counting air bottle compartments and other misc. storage areas. The math just doesn't add up.....

Compar	tment Volumes						
Compt.	Location	Width	Lower Height	Lower Depth	Upper Height	Upper Depth	Cubic Feet
_	Driver's Side Ahead of			-		-	
D3	Rear Axle	39.19	25.5	26	37.5	12	25.24
	Driver's Side Above						
D2	Rear Axle	83.88	25.25	12			14.71
	Driver's Side Behind						
D1	Rear Axle	45.12	25.5	26	31.5	12	27.18
	Passenger's Side						
P3	Ahead of Rear Axle	39.19	25.5	26	37.5	12	25.24
	Passenger's Side Above						
P2	Rear Axle	83.88	25.25	12			14.71
	Passenger's Side						
P1	Behind Rear Axle	45.12	25.5	26	31.5	12	27.18
R1	Rear	27.75	35	26.25			14.75
				· -		TOTAL	149.02

Compartment Space



Common location for the Kussmaul battery charger and air brake system compressor is in the front body compartment, reducing the usable compartment space even further. Battery charger can be installed inside the cab crew seat riser compartment depending on desired configuration.





Storage Capacity





Only a 2,500 pound equipment allowance.

Fan Storage



Only 25.5" MAX height in lower portions of all compartments. Most PPV fans larger than 16" will not fit on a slide-out tray. 18" fans could fit WITHOUT a tray, making them very hard to get in out of the compartments. Fans larger than 18" will not fit, unless they are stored in the rear R1 compartment or you upgrade to the PUC style body/pump module configuration. The floor of this compartment is almost 4 feet (47") from the ground when the truck is <u>not</u> up on the outriggers making it virtually impossible to store a fan there.





Fan Storage





This is an older Tempest 16" fan. It barely fits in the compartment before it contacts the compartment notch.

Ground Ladder Storage





GROUND LADDER STORAGE

Ladder tunnels will be provided at the rear of the apparatus on either side of the turntable.

Tunnels will be capable of holding up to two (2) two-section pumper style ladders on each side not in excess of 22.00" wide or 5-13/16" in thickness.

The ladders will be held captive top and bottom by stainless steel tracks. A polyethylene wear plate will be provided to prevent ladders from being scuffed by contacting metal parts. The plate will be mounted to the bottom of the entrance area of the ladder tunnels.

All ladders will be removable individually without having to remove any other ladder.

A Velcro® strap will be provided to help contain the ladders.

A smooth aluminum door will be provided on each ladder tunnel.

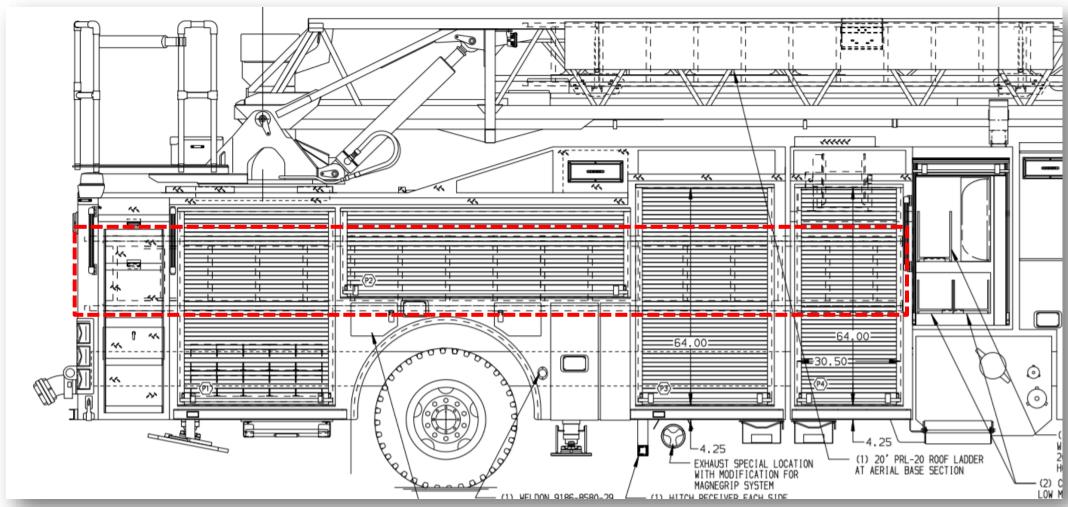
The standard configuration includes a 35' 3-section Alco-Lite extension ladder, which is 31 lbs. heavier than a 2-section. The longest 2-section that will fit is 28'.

According to their specs, they cannot fit a Duo-Safety brand 35' 3-section ladder in the standard ladder tunnel.

Ground Ladder Storage



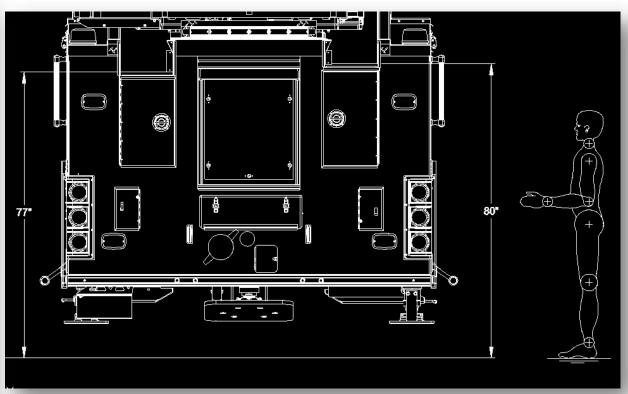
The Ascendant 107' single axle body is 17'-4" long, so in order to fit a 35' 2-section ladder, must go with PUC pump configuration (much more expensive).





The hose bed access points are located above the ladder storage, making them extremely high from the ground. The left side hose bed is 77" from the ground and the right side hose bed is 80" from the ground. This is with the unit NOT up on its outriggers. How do you access the hose? The only way to access these is to climb the side turntable access ladders. If you chose a body with horizontally stored ladders, there is no access ladder on the officer's side, so that hose bed is not accessible from the side.









With the truck up on its outriggers, the hose beds are nearly impossible to reach from the ground. Justin is 6'-1".

This department's mentality is to use someone else's hose if at all possible.....





To fit 1000' of 5", the hose has to be loaded in front of the turntable area across the width of the truck (depending on which body is selected). It is not a straight rectangular bed. They are also using a plain perforated flat sheet of aluminum to keep weight down, unlike the slatted flooring they use in their other aerial products. This area of the main hose bed is not flat. It is stepped up over the water tank, making loading hose more challenging.





This image is of the Texas Chute Out style body which allows for all of the LDH to be on the officer's side. If using the quint body, one whole side plus part of the opposite side (including the middle section) are needed to achieve the advertised hose loads.

A nylon Velcro strap across the front of the hose bed is used to "secure" the hose. This leaves all of the hose exposed to the elements.

AERIAL HOSE BED HOSE RESTRAINT

The hose in the hose bed will be restrained by a black nylon Velcro strap at the top of the hose bed and a 1.00" black nylon web design with a 2.00" box pattern at the rear of two (2) hose bed(s). The Velcro strap will be installed to the top of the hose bed side sheets. The rear webbing will have 1.00" web straps that loop through footman loops and fasten with spring clip and hook fasteners.



This video shows	5 5" LDH being deployed from the hose beds of a standard quint body. The video states this is 800	0' of 5".