

A photograph of three men inside an ambulance. One man is seated on the left, wearing a patterned shirt and khaki pants, looking at a laptop. Another man is kneeling in the center, wearing a dark jacket and jeans, looking towards the camera. A third man is partially visible on the right, wearing a grey sweater and jeans. The ambulance interior features medical equipment, storage cabinets, and yellow handrails.

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EMSWORLD



DESIGNING AMBULANCES AROUND THE REALITIES OF EMS

How Purposeful Engineering Helps
Providers Stay Protected While
Delivering Exceptional Care

Solutions Designed for Safety

For decades, ambulance design has focused heavily on securing equipment, maximizing storage, and meeting operational requirements.

Yet one critical factor has often been overlooked: the safety and workflow needs of the clinicians who spend thousands of hours providing patient care inside these vehicles. Today, a new generation of ambulance innovation is challenging long-standing assumptions by placing EMS providers at the center of the design process.

This e-book explores how purposeful engineering and real-world provider feedback are shaping the future of ambulance safety. Drawing on insights from Demers Ambulances engineer Antoine Schryer and the development of the FX Action™ Seat, it examines how ride-alongs, focus groups, ergonomic evaluations, and data-driven analysis are helping manufacturers better understand the realities of patient care in a moving vehicle.

The result is a growing emphasis on solutions that support both caregiver safety and clinical effectiveness.

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Photos courtesy Demers Ambulances





Observing medics working unsecured in moving vehicles drove the engineering team at Demers Ambulances to seek a safer seating solution.

PURPOSEFUL ENGINEERING

Designing the right ambulance for provider safety

By James Careless

Ambulance design is evolving from a process driven strictly by engineering specifications into one focused intently on the clinicians who spend thousands of hours inside these vehicles.

In a recent edition of the [EMS World Podcast](#), host Mike McCabe spoke with

Antoine Schryer, a mechanical engineer at Demers Ambulances, to talk about the changing nature of emergency vehicle design and how true innovation begins with listening to the end user.

Setting the Stage

Schryer began by describing his ten-year background at Demers and how his

perspective has shifted. "When I started, I was in our customization department... meeting customers day in, day out and listening to their needs," Schryer shared. However, his definition of innovation fundamentally changed when he moved to platform development. "Before, innovation was finding solutions for a specific customer. Now it's trying to find a

The Demers FX Action™ Seat is an ergonomic seating system designed to follow a clinician's natural movements. It intentionally eliminates the long-standing trade-off between staying restrained and staying engaged in care.



solution for all customers—one solution that addresses 80 percent of the market's needs," Schryer explained.

Having the Right Approach to Design

Having outlined this shift, Schryer emphasized the need to base design on real-world constraints rather than theory. "On paper it's a lot easier, but we need to get away from the paper," he told McCabe.

Demers utilizes focus groups to bring medics from different services into the same room, revealing shared issues and diverse workarounds. However, Schryer stressed that the most insightful revelations come from engineers conducting in-person ride-alongs.

"We can visualize the paramedic at work and say, 'Hmm, there must be a better way for this,'" he noted. "They're not complaining because that's what they know. That's how they were trained. But when you look at it from an engineering background, you say, 'There has to be a simpler, safer way to do that.'"

To complement focus groups and in-person ride-alongs, Demers uses "camera systems to actually record and use software analytics to actually help map out how the medic is interacting with [the] environment," said Schryer. These advanced tools allow the engineering team to create a highly accurate picture of where inefficiencies and dangers lie inside the patient compartment.

By tracking exactly how an EMT or paramedic navigates this space during a transport, designers can mathematically optimize the interior layout rather than relying on guesswork or tradition.

The FX Action™ Seat and Other Features

Observing medics working unsecured in moving vehicles drove the engineering team to seek a safer seating solution. They built an empty plywood box mirroring an ambulance interior and placed a stretcher in the middle to study how providers naturally operate.

When a medic utilized a rolling doctor's

stool during the simulation, it sparked a breakthrough. "The flexibility that that doctor's chair provided was an 'aha' moment," said Schryer. "You can't have one fixed position; you need to get that flexibility."

This realization led directly to the FX Action™ Seat. Developed in direct collaboration with first responders, the FX Action™ Seat is an ergonomic seating system designed to follow a clinician's natural movements. It intentionally eliminates the long-standing trade-off between staying restrained and staying engaged in care, allowing medics to remain safely buckled while continuously accessing the patient and critical equipment.

Schryer highlighted its saddle-style base: "It pushes your legs onto the side and puts you in a much more stable position. Your feet are angled wider and you're stable in your seat," he explained.

The seat features a single-button operation, allowing it to pivot and slide seamlessly without a user manual. Crucially, it incorporates a four-point safety belt designed around real provider behavior.



"I know that if you take the time to buckle in and you need to unbuckle to do your job, you will never rebuckle during a call," Schryer stated plainly. To solve this, the harness is engineered so medics can stand up, reach their gear, and sit back down while remaining safely belted the entire time.

Mitigating Dangers Inside the Cabin

Beyond ergonomic seating and workflow optimization, Schryer is deeply passionate about changing the EMS industry's overarching safety priorities. He pointed out a glaring inconsistency in traditional ambulance procurement: Agencies are

meticulous about securing their gear, but often overlook the humans operating it.

"I've heard so many times how when the customers come in, they worry about their equipment being fixed and secure," said Schryer. However, the reality is that heavily fortified cabinets and unyielding equipment mounts can become lethal hazards if the provider is freely tumbling through the cabin.

"The medic can become a projectile," he warned. "So you want to keep them belted and secure themselves. You don't want them to hit that equipment that's not going to move if you are in a collision. You want everyone to stay where they were located in the first place."

This is why designing an ambulance in which both the lifesaving tools and the life-saving personnel are equally protected has become the ultimate standard for modern manufacturing.

The Next Generation

Schryer's vision for Demers Ambulances extends far beyond individual features such as the FX Action™ Seat. He is calling for a complete cultural reset regarding how emergency vehicles are specified and purchased.

"I truly hope that these ambulance service leaders are going to break down those traditions and those barriers of, 'Well, we've always done it that way,' and start re-questioning themselves and start with a blank page," urged Schryer. It's all about looking forward and recognizing that the EMS workforce is changing, he added. "What about the next-generation medics? What do we want them to be working in? What do we want our kids to be working in?" By constantly challenging the status quo, he believes the industry can revolutionize occupational safety for EMS professionals.

The Bottom Line

The era of designing ambulances solely around equipment securement is over. As McCabe summarized, "I would argue that the best innovations really don't happen because people think they know what EMS needs, that they happen when manufacturers sit down with the providers. When conversations become partnership, everyone's going to benefit from that."

Ultimately, the future of safe ambulance design depends on replacing the "we've always done it that way" mentality with uncompromising standards that secure, protect, and support the clinicians saving lives in the back.

"Innovation: it's hard to do and also it's even harder to accept," Schryer reflected. "Change is not natural for us, but if we truly want to evolve as an industry, we really need to start breaking down those barriers and embrace change."

Listen to the Podcast

Ambulance design is evolving from a process driven strictly by engineering specifications into one focused intently on the clinicians who spend thousands of hours inside these vehicles. Host Mike McCabe spoke with Antoine Schryer, a mechanical engineer at Demers Ambulances, to talk about the changing nature of emergency vehicle design and how true innovation begins with listening to the end user.

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James Careless is a Canada-based freelance writer and frequent contributor to EMS World.

NO COMPROMISES

How the Demers FX Action™ Seat is helping first responders stay buckled while delivering care

By Kirsten Barnhart

Inside every patient compartment, first responders make split-second decisions while working in a moving vehicle. For decades, that reality has forced EMS crews into a compromise: stay buckled and lose access to critical equipment or unbuckle and compromise their own safety to deliver effective patient care.

Demers Ambulances set out to eliminate that compromise. The result is the **FX Action™ Seat**, one of the defining innovations inside the FXP 174 Type I ambulance. Developed alongside first responders through real-world scenario re-enactments, design focus groups, ergonomics evaluations, prototyping, and extensive testing, the seat was created in response to a challenge crews have

faced for years. EMS providers needed a seating solution that matched the realities of everyday patient care while improving safety, mobility, and workflow inside the patient compartment.

That demand ultimately helped shape the **FXP174** and its focus on a safer, more ergonomic patient care environment.

Designed Around Real EMS Movement

The FX Action™ Seat was engineered with one goal in mind, says Demers engineer Antoine Schryer.

“The true problem the FXP174 addresses is keeping the EMS crew seated and belted while providing patient care,” Schryer explains.

Inside an ambulance, even everyday road conditions create real safety risks for an unrestrained provider. Sudden stops, evasive maneuvers, sharp turns, and collisions can quickly turn the patient compartment into a dangerous environment. Yet for years, many first responders have had little choice but to unbuckle in order to reach equipment, reposition around the patient, or deliver care effectively.

The FX Action™ Seat was designed to work with first responders while eliminating the need to unbuckle.

Unlike traditional side-facing seats that restrict movement, the FX Action™ Seat features a pivoting, sliding mechanism that allows paramedics to move laterally along the stretcher while remaining safely



Every decision at Demers Ambulances is designed to improve the crew experience through intentional engineering.

Input from first responders shaped the FXP 174 platform from the earliest conversations through final design decisions.

restrained. Providers can access equipment, reposition themselves, and administer care from head to toe without repeatedly standing up or removing their seatbelt.

The movement is controlled through an intuitive front-mounted button and an accessible adjustment lever beneath the seat. The saddle-style design was intentionally developed to improve ergonomics while maximizing mobility in tight patient care environments.

For crews, the experience feels less restrictive and more natural. For agencies, it represents a meaningful advancement in occupant safety. Discover how the innovation works in this [video](#).

Safety Without Sacrificing Efficiency

Demers engineers understood from the beginning that innovation alone was not enough. The seat needed to prove itself under real-world conditions.

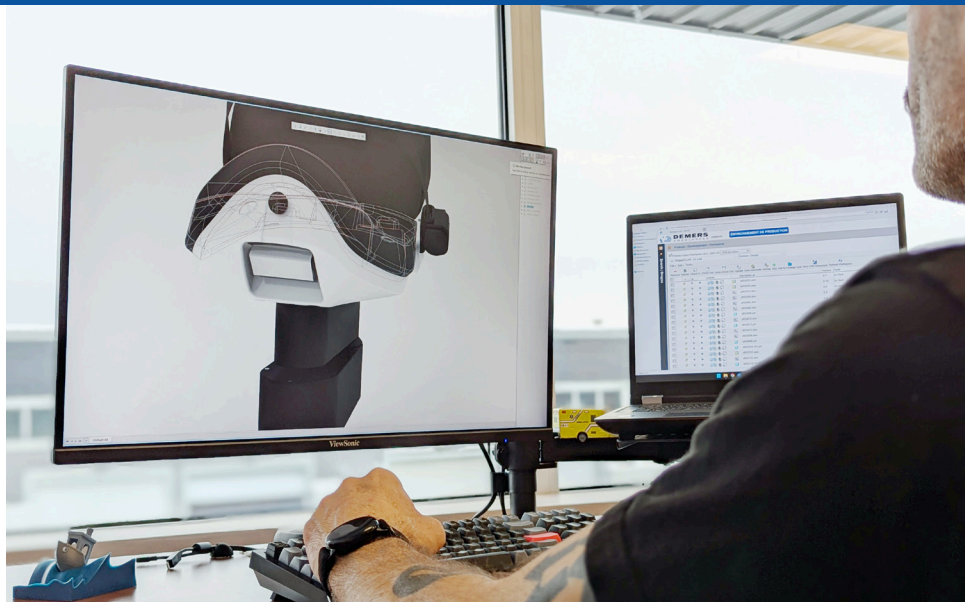
To validate the FX Action™ Seat, Demers conducted extensive testing focused on safety and long-term reliability.

That testing included:

- Cyclical durability testing designed to simulate years of daily EMS operations and confirm a lifespan equivalent to — or longer than — the ambulance itself.
- Destructive pull testing to evaluate floor anchors, seat belt assemblies, and aluminum seat bases under progressive force.
- Dynamic deceleration testing using crash-test dummies in multiple seating configurations to simulate frontal and lateral impacts.
- Ergonomic evaluations completed alongside paramedics and ergonomics specialists using a mobile laboratory environment.

The seats are also validated against applicable FMVSS and SAE testing requirements, ensuring they meet mandatory and voluntary safety standards and industry best practices.

The outcome is a seating system designed to exceed expectations for both crew safety and operational performance.



Built From First Responder Feedback

The FXP 174 platform was not developed in isolation. According to Schryer, first responder input shaped the platform from the earliest conversations through final design decisions.

“We really worked closely with our customers to tailor the FXP 174 to meet and basically exceed market needs,” Schryer says. “They saw the potential of the FX Action™ Seats, and it was up to us to create a solution that maximized that potential in a layout that works for them.”

Demers engineers conducted focus groups with EMS professionals and consistently gathered feedback during prebuilds, inspections, trade shows, and customer conversations across North America.

Every design decision reflects the same philosophy that defines the [Demers Difference](#): improve the crew experience through intentional engineering.

Challenging the Status Quo in EMS

EMS providers have always prioritized patient care, often at the expense of their own safety. Demers believes ambulance design should help change that reality.

“EMS first responders will always prioritize their patient over their own safety,” Schryer explains. “It’s really up to leaders and agencies to provide the proper tools to their first line care providers that keep

them safe while allowing them to work without constraints.”

The FX Action™ Seat represents a shift in thinking for the industry. Instead of asking providers to adapt to the ambulance, the ambulance adapts to the way providers actually work.

That philosophy aligns directly with Demers’ commitment to intentional, provider-focused design: building safe, ergonomic, feature-rich ambulances engineered around real-world EMS challenges.

A Glimpse Into the Future

For Demers, the FX Action™ Seat is not the finish line. It is the beginning of a broader evolution in ambulance design.

“To me, the FXP 174 is a gateway to the future,” Schryer says. “The seat is just a stepping stone and there’s a whole bunch of other technologies that could just make life easier and safer for EMS providers.”

As EMS agencies continue searching for ways to improve provider retention, reduce injuries, and create safer patient care environments, innovations like the FX Action™ Seat will continue shaping the future of the ambulance industry.

To learn more about the FX Action™ Seat and how the innovation is providing a safer working environment for first responders, visit the Demers Ambulances [FX Action™ Seat](#) innovation page.

Kirsten Barnhart is content marketing specialist for Demers Ambulances.

FXP 174

Type I Ambulance



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