

FMVSS 226; The new Federal law that may kill people right in front of you

-Tim O’Connell - Rescue 42, Inc. -- May 2019

Vehicle Emergency First Responders (Law Enforcement Officers, Medics and Firefighters) are facing a huge problem in the form of a new Federal law called FMVSS 226* that has gone into effect for 2020 model year vehicles. People may die if Emergency Responders don’t prepare for it. To show you the problem, take a minute to watch this YouTube video of a Law Enforcement Officer desperately trying to rescue a woman from a burning car. Turn up the volume to hear what she says at 58 seconds.

Warning; Graphic imagery and language. <https://youtu.be/SDDNhWM1SME>

What you just watched is an example of what you will start seeing on almost every new 2020 model year vehicle; Laminated glass side windows. Like the Officer you just watched, the majority of First Responders don’t have a fast, easy way to get into the vehicle through these windows... yet.

Federal Motor Vehicle Safety Standard #226 (FMVSS 226 - Code of Federal Regulations 49 CFR 571.226) is a mandatory requirement for most vehicles manufactured or imported into the US after 9/1/2018. This law requires vehicle manufacturers to implement technology to ensure that a person in the first three rows of seats remain within the confines of the vehicle during a rollover crash. This is accomplished with a combination of deployable, persistent side curtains/airbags and “Advanced Glazing”, which typically means laminated glass side windows.

Today, almost all vehicles have laminated glass windshields and tempered glass side windows. Tempered glass is a single sheet of hard glass that has been cooled rapidly, causing it to have strong internal stresses. When tempered glass is punched with a center punch or struck with a baton or even a rock, the entire sheet instantly shatters into small glass pebbles. It is extremely easy to remove. Laminated glass is made of two sheets of very tough glass bonded together by a plastic sheet. When laminated glass is struck hard enough to break, it cracks and splits into chunks and spears, but they remain in place because they are bonded to the plastic. As you saw, it is extremely hard to remove.



Standard broken tempered glass side window. Note the complete fracture and glass pebbles. These windows are very easy to remove.



Laminated side glass cracks but stays in place. Note the large, persistent side restraint curtain that blocks the view of interior. These windows are very, very hard to remove!

Tempered side glass often shatters during a crash. It always shatters during a rollover. Laminated glass may crack, but it stays in place because of the plastic layer. An unfortunate consequence of tempered glass side windows is that unrestrained (no seatbelt) occupants are often ejected and killed when the side windows shatter during a rollover. Keeping these unrestrained occupants inside the vehicle is the reason for FMVSS 226, which is also called the “Ejection Mitigation Rule”.

At the writing of this article (May, 2019), it is predicted that much less than 1% of vehicles on the road today have laminated side windows. With approximately 17 million new cars sold in the US each year, that number is going to increase rapidly. Soon most vehicles will have laminated side glass.

Of the hundreds of Firefighters we’ve surveyed, a small percentage knew this information. Almost no Medics or Law Enforcement Officers we talked to knew this. In fact, many didn’t believe us!

Why is this so important? What do I mean when I say, “people may die”? To answer these questions, I need to discuss standard emergency response to incidents involving motor vehicles.

Incidents involving occupants locked/trapped in vehicles vary from simple things like a dog locked in a hot car to a major crash with trapped occupants. Here is a partial list:

- Dog or child locked in a car – concerning in fair weather, an emergency in hot weather
- Unconscious/nonbreathing/no heartbeat victim locked in a car – heart attack, stroke, overdose
- EDP – Emotionally Disturbed Person, mentally/drug/alcohol challenged person can’t open door
- Non-compliant suspect removal or apprehension, felony vehicle search, etc.
- Visible or suspected weapon in car – suspects hands not allowed to unlock door (gunpoint)
- Person trapped due to mechanical lock/latch failure from fire, crash, electrical issue, etc.
- Doors jammed due to a collision

With current vehicles, accessing occupants at these events is not a problem for Emergency Responders because breaking tempered side windows is so easy. Every Law Enforcement Officer can shatter a side window with their baton, window punches, gun or even a rock. Medics on Ambulances carry window punches and can improvise if needed. Firefighters have a large supply of devices to break tempered glass. Even civilian bystanders can easily shatter tempered side windows.

	
<p>Law Enforcement Officer breaking tempered side window with an Asp collapsible baton</p>	<p>Resqme® window punch breaking a tempered side window</p>

Reconsider the above-mentioned scenarios but replace the tempered side glass with laminated side glass and see how it changes the picture. You just watched an example as a Police Officer had to deal with a laminated side window. All those cool window punches, batons, breaker tools or even basic striking tools either won't work or will take a lot of work (and time) to get through a window.

This means that First Responders either can't access vehicle occupants or will take a long time to do so. A victim trapped in a burning car, a child dying in a hot car or a non-breathing/no heartbeat patient only have seconds to live without help and may die while First Responders watch helplessly through the laminated window waiting for Firefighters to arrive with glass tools. However, there is a simple solution that can have the door open or the window removed in 5-10 seconds! More on this later...

How do Emergency Responders deal with this serious emerging problem today? That depends on which responders arrive on-scene first. Law Enforcement is almost always first on-scene, and may be the only ones on-scene for EDP's, non-compliant suspects, etc. A vehicle fire will obviously draw a Fire Engine, while a medical aid will draw both Fire (typically an Engine) and an Ambulance. A traffic accident will also get a Fire Truck/Ladder or a Squad/Rescue for their hydraulic extrication (i.e. "Jaws of Life") tools. These different responders vastly differ in their capabilities to deal with laminated glass.

Let's evaluate their different capabilities.

Fire Department

Fire "trucks" are typically divided into three types: Engines, Trucks (also called "Ladders") and Squads or Rescues. Fire Engines make up the largest number of apparatus (about 75,000 in the US) and are primarily tasked with fighting fire and providing medical aid. They carry large axes that can chop through laminated glass. Axes will do the job but are extremely dangerous for those inside the vehicle, particularly after a crash. This is because FMVSS 226 also requires persistent side airbags and Anti-Ejection curtains that stay in place to keep the occupants inside the vehicle during roll-overs (see pictures above and below). These large side curtains often block your view of the victims. If you blast an axe through a laminated side window into a victim's head or neck, you will probably kill them.

Trucks and Ladders are primarily tasked with rescuing victims, as are Squads and Rescues. These apparatuses carry tools to get through laminated glass because they have an occasional need to cut laminated windshields. Besides axes, tools include laminated glass hand saws and battery powered reciprocating saws ("Sawzall"). Since cutting windshields is so infrequent, these tools are often an afterthought, and rapid deployment is not a priority. There is serious risk of harming or killing a patient you can't see behind an Anti-Ejection curtain since these sawblades intrude several inches through the curtain into the vehicle. One stroke of a sawblade can remove an eye or cut a Carotid Artery!

There are only an estimated 10,000 of these units in the US, and they frequently arrive much later than the Engines. 70% of the US Fire Service is volunteer, which can significantly increase response times, particularly in rural areas. Law Enforcement and Medics often have a significant wait for Fire apparatus to arrive, which may result in fatalities for burning vehicle and cardiac/respiratory patients.



FMVSS 226 requires side airbags and Anti-Ejection curtains to help prevent occupant ejection during a rollover. They stay in place after the accident and will block the view of occupants/victims. They will need to be cut free. Using axes and saws is extremely dangerous when you can't see the victims!

Ambulances

Ambulances are often first on-scene, sometimes by a significant amount of time. They currently have nothing that can get through laminated glass and may have to wait a long time to start medical aid until Fire arrives. A non-breathing or arrested heartbeat patient only has about four minutes to live without medical intervention, so the Medic's inability to access the patient may cost lives. There are an estimated 90,000 ambulances in the US.

Law Enforcement

Law Enforcement units are almost always the first or only Emergency Responders at a scene with an occupied vehicle. They are credited with saving thousands of lives due to their ability to instantly remove tempered side windows with their batons, Asps and window punches to access the occupants. Many LEOs are now carrying Naloxone (Narcan®) to save the lives of non-breathing drug overdose patients as well as fellow Officers exposed to drugs such as Fentanyl. Rescuing children or animals trapped in hot cars or starting CPR on heart attack patients until medical personnel arrive are routine events. As you saw in the video, saving victims from burning cars is extremely time critical. During non-medical events, they may need to assist an Emotionally Disturbed Person (EDP) or mentally, drug or alcohol challenged person from a vehicle if they cannot release themselves.

LEOs also have situations where non-compliant suspects simply refuse to open the door and must be removed. Tense situations occur where an armed suspect is at gunpoint and instructed not to move. In this case the Officers want to open the door themselves and control the scene. The number of Law Enforcement vehicles in the US is very difficult to estimate, but a good guess is 500,000. Virtually none of these units carry anything that can quickly access a person behind laminated glass windows.

Summary: Here is the current picture across the US; we have a rapidly emerging environment where large numbers of vehicles will be hitting the roads with laminated glass side windows. Of the approximately 675,000 Emergency Response vehicles in the US that must be able to quickly perform a rescue or get to patients/suspects in a vehicle;

- ≈10,000 Fire Department Squads, Rescues, Trucks and Ladders are prepared to access the interior of a vehicle through laminated side glass, although doing so with existing laminated glass cutting saws and axes may endanger unseen patients behind the new side curtains.
- ≈75,000 Fire Engines typically just have an axe that can chop through laminated side glass, again very dangerous with unseen victims behind side curtains.
- ≈590,000 Ambulances and Law Enforcement vehicles have nothing to access the interior of a vehicle except possibly beating tools (batons). They will either have to try to slowly beat their way in or wait to administer medical aid until a Fire apparatus can arrive.
- **Without rapid access and rescue, vehicle fire victims and medical patients may die.**

This emerging new environment of laminated side windows will leave the vast majority of Emergency Responders outside the vehicle staring in at patients while they wait for Fire units to arrive. Even Firefighters are not prepared for patients hidden behind side curtains and laminated windows.

What is needed is a laminated glass cutting tool that is safe for trapped occupants, easy for anyone to use, and is extremely fast. Laminated glass cutters must move from just being an occasional windshield cutter by Fire/Rescue units to a Critical Life Saving Tool carried by **all** Emergency Responder units.

The answer to this emerging problem is **The Ripper™**.





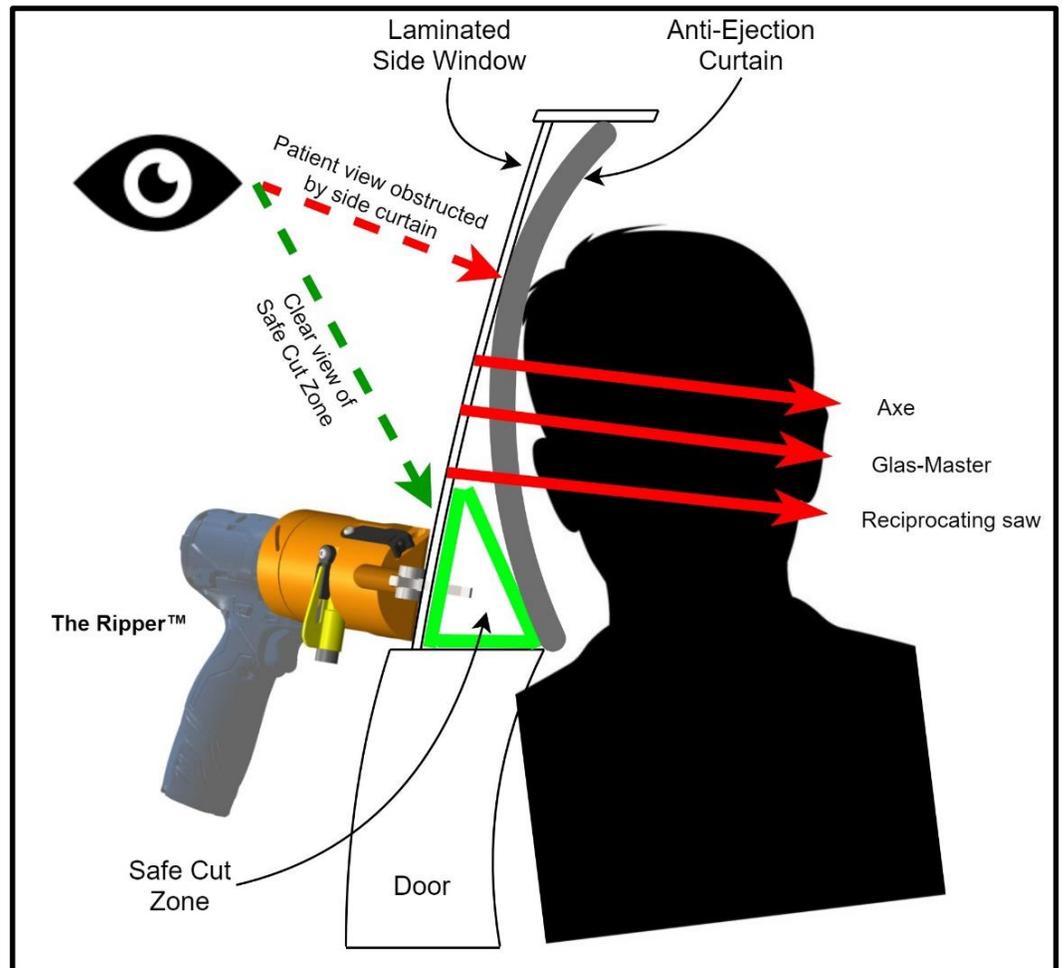
The Ripper™ is a simple attachment for commonly available battery powered Impact Drivers. It punches through the laminated glass and opens doors or removes laminated side windows **in less than 10 seconds** while protecting the occupants from possible harm due to axe or saw intrusion.

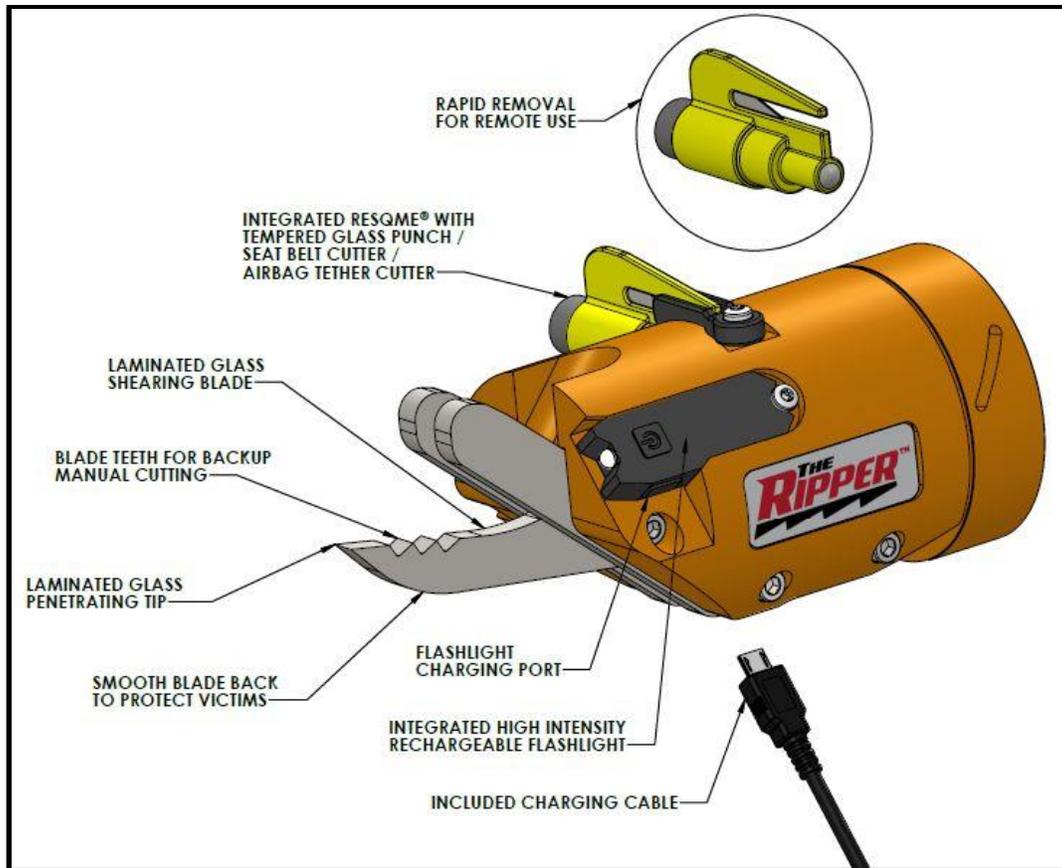
Please watch this short video to see The Ripper™ open a car door and remove a laminated side window in seconds:

<https://youtu.be/zGUssQgKk94>

As you saw, side “Anti-Ejection” curtains will block the view of the vehicle occupants. Traditional laminated glass cutting tools can be extremely dangerous for the patient. A Sawzall will easily cut through a patient’s throat!

The Ripper™ operates entirely within the small “Safe Cut Zone”. This area is always visible to the rescuer. The piercing tip only penetrates about an inch, then rotates against the glass to cut. The back of the blade is rounded for patient protection.



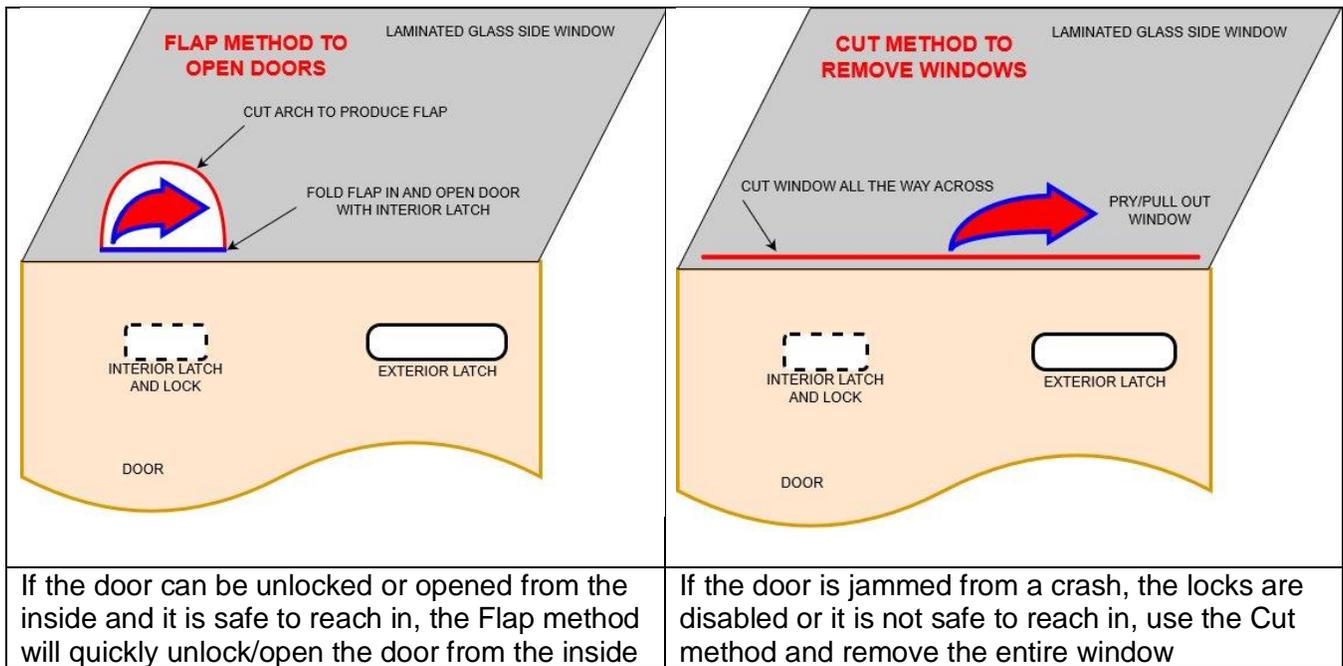


Key features of The Ripper™

- **Open any door or remove any side window in less than ten seconds! Quickly cuts windshields.**
- Uses readily available commercial Impact Drivers for reliability, power and durability
- Interfaces with popular Impact Drivers - Milwaukee®, DeWalt®, Bosch®, Ridgid®
- No proprietary batteries—uses the same batteries you may already own - available everywhere
- Laminated glass piercing tip – penetrates easily through laminated side windows/windshields
- Patient safety – shallowly penetrates at the base of the side window along the interior window shelf. Patient’s head/neck cannot fit in that small space, and that area is visible outside the side curtain.
- Round back of cutting blade intrudes less than an inch and won’t harm occupants when cutting
- Inside-out cut action pulls most glass debris out of the car away from occupants
- 360° swivel for left-hand or right-hand operation - Turns left or right without switching hands
- May be operated one handed to free other hand for service weapon (example: armed suspect)
- Integrated/removable Resqme® tempered glass punch, seatbelt and **side curtain/airbag tether cutter**
- Integrated rechargeable hi-intensity LED light
- Special blade teeth for manual cutting if battery is dead
- Blaze Orange color for LEO environment - does not look like a firearm – Conforms to 15 U.S. Code § 5001
- Belt/pocket clip for carrying The Ripper™ and for LEO potential weapon control
- The Ripper™ is easily removable to allow Impact Driver to be used for other purposes
- The Ripper™ has a 3-year limited warranty
- The Impact Driver’s manufacturer warranty stays in place (example: Milwaukee - 5 years)

Procedures for opening vehicle doors and/or removing side windows in less than 10 seconds

1. Try the door handle to check if the door is locked or jammed
2. Turn The Ripper™ sideways and push the black tip of the Resqme® tool against the window until it triggers the punch. If the window shatters, it is tempered glass and you're in. If not, it is made of laminated glass and will need to be cut.
3. If the door is just locked and the occupant is unconscious or can't/won't open the door, punch The Ripper™ into the glass and cut an arch over the interior latch, push the flap in with your hand or The Ripper™ and reach in to unlock or open the door. Only do this if it safe to reach in.
4. If the flap method fails or you need the whole window removed, punch The Ripper™ into the glass and cut all the way across the base of the window. Use the flap hole to pull the window out or pry the center of the cut glass out with The Ripper™, grasp and pull the window out.
5. If The Ripper™ battery is dead, rock The Ripper™ like a can opener to manually cut the glass.
6. If needed, remove the Resqme® tool and use the cutter to cut seatbelts or side curtains/tethers



The Law Enforcement community strongly insisted that The Ripper™ be brightly colored to prevent an Officer from mistaking The Ripper™ for a gun and possibly shooting someone. Black tools that can be mistaken for a gun are extremely dangerous in LEO situations! The standard Taser is brightly colored for the same reason.

The Ripper's™ Blaze Orange color conforms to Federal Law 15 U.S. Code § 5001, the same law that prevents toy guns from being mistaken for a real gun.



- The Ripper™ is available for several different 18-volt and 20-volt Impact Drivers to match existing battery systems in Rescue type Fire apparatus: Squads, Rescues, Trucks and Ladders.
- Small, lightweight 12-volt Impact Drivers are perfect for units that don't typically carry other battery powered tools such as Fire Engines, Law Enforcement vehicles and Ambulances.



The Ripper™ can be purchased in a kit with just The Ripper™ head (bring your own Impact Driver), or as a complete kit with Impact Driver, two batteries and a battery charger. Kits include a carry bag.

The Ripper™ only fits certain models of Impact Drivers, and is available to fit on or purchased in a kit with:

- Milwaukee 12-Volt 2553-22
- Milwaukee 18-Volt 2853-22
- DeWalt 20-Volt DCF887
- Ridgid 18-Volt R86036K
- Bosch 12-volt PS42

The world of Highway Vehicle Emergencies is changing drastically, and Emergency Responders need to prepare for this new environment or risk having to watch helpless victims die.

The answer to this emerging life-threatening environment is The Ripper™.

The Ripper™ is sold exclusively through the Rescue 42 Dealer network. Please visit Rescue42.com to find a dealer near you or for more information on the Patent-Pending Ripper™ lifesaving tool.

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* To read the details of FMVSS 226, please click→ <https://www.nhtsa.gov/fmvss/ejection-mitigation>