

IN FOCUS / SAFE-T-PUNCH

Punching above its weight

Jonathan Welch speaks to the South African inventor of Safe-T-Punch and learns how the product came to become familiar on so many vehicles



Inventor Ivan Le Roux designed the device after a South African bus crash. **SAFE-T-PUNCH**



There are lots of things we take for granted in life. Safety is one of them. We expect to be safe as we go about our daily business, and when catching a bus few of us ever give it much of a thought. Nor should we need to. We expect a coach, bus or minibus to be driven safely, by someone with the skill and experience to transport us to our destination. With the addition of modern technology, we expect that it will intervene to keep us safe even if the driver is slow to react.

But we rarely consider what happens when things actually do go wrong. Those rare, headline-news moments, when something catastrophic happens. That's the time when we rely on the built-in safety features doing their job, those which remain passive and unused for the lifetime of most vehicles: roll-over hoops that hide in plain sight to maintain structural integrity, or seatbelts that prevent us from being thrown around inside – or worse, flung out of the vehicle.

All coaches and buses in the UK have to be fitted with some kind of emergency egress, and most people would point to the offside emergency door as being the most common and most obvious means of escape, should it ever be



The device is now fitted by numerous vehicle manufacturers across the public transport and construction sectors. **SAFE-T-PUNCH**

needed. Others might point to emergency door control buttons, whilst plenty of passengers would once also have pointed to the emergency break glass hammers, but these have become less common in recent years, replaced by a small and relatively innocuous device mounted within the glass itself.

Small but important

Whilst there have been some more recent 'copycat' ideas, the original version of that small round device was the Safe-T-Punch, developed not as you might expect by a bus or glazing manufacturer, but in fact the result of many years of work and development behind the scenes by a South African company, in response to a singular event which left an indelible

impression on its creator.

CBW caught up with Safe-T-Punch inventor, South African born Ivan le Roux, to hear more about what led to him creating the device, which has had an almost unseen but revolutionary impact on bus safety. "I was born in 1966, and have lived my whole life in South Africa," Ivan explained. "My family's history here goes back to at least 1692. As a kid I was a bit adventurous; you don't worry too much about your school career when you're young. Things written in a book never really appealed to me. I learned much better through practical experience, though I didn't have an education in engineering or anything like that."

"I did my two years of national service, and spent some time in the active zone in Angola for a year. I had to grow up very quickly. During the time of my national service, from 1985 to 1986, while I was doing basic training there was a bus accident in Westdene. I grew up in a place called Parktown in Johannesburg, and Westdene is one of the neighbouring suburbs."

Accident to innovation

The concept behind Safe-T-Punch was sparked by that bus accident in Westdene in 1985, where passengers were unable to



Safe-T-Punch made its UK debut on the Wrightbus Streetlite. **RAY WARD**

IN FOCUS / SAFE-T-PUNCH



The evolution of the design: from left the first mass produced Safe-T-Punch and the device by which the patent was secured and supplied to its very first customer, Metro Bus in Johannesburg; an STP40N with pull pin and original Safe-T-Punch logo; an STP40D with breakable release tag; an ABS Plastic STP50P with pull release tag; and an STP50S, part of the stack device designed for double-glazed windows. **SAFE-T-PUNCH**

escape after the vehicle entered deep water whilst crossing a dam at an estimated 25 to 30 miles per hour. It was at that event raised a fundamental question: in an emergency, how easily can passengers actually exit a vehicle? At the time, bus windows were designed for retention and weather sealing, not for rapid egress. The assumption that a person could simply force a window out did not align with the mechanical realities of toughened glass.

This led Ivan to the development of a simple but highly specific idea: a device that could reliably transfer human input force into sufficient impact to break toughened safety glass, under real-world conditions.

The accident occurred on 27 March 1985 and remains one of South Africa's most remembered transport disasters. While various theories circulated publicly regarding the cause, no definitive explanation was ever universally established. What remained undeniable was the outcome: passengers were trapped inside a submerged bus with inadequate means of escape.

Difficult questions

"When it came to investigating and looking at what had happened, people started to ask questions," said Ivan. "People should always have the right, and the ability, to escape danger; that's rule one, the very top of the pyramid. These buses had standard bus windows fitted with rubber beading. If

it's brand new and you kick it in exactly the right place and you're a big strong guy, then maybe you'll get the window out, but the homologation criteria and roadworthiness criteria require permanent retention and a weatherproof seal of the windows. They're not designed to come out."

Early engagement with industry stakeholders highlighted a gap between regulatory intent and practical implementation. Emergency egress requirements existed, but solutions often relied on assumptions about human strength, positioning, and tool availability in high-stress situations. This reinforced to Ivan the need for a solution that removed variability and delivered consistent, repeatable performance.

"So I made one," he explained. "I used my grandfather's lathe and some metal and plastic. I used to spend lots of time creating things like that. I put it together and got an old stove front door with

toughened glass. And nothing happened. I asked myself 'what's going on here?' and I turned it over and I looked at it, and the tip had gone blunt.

"Little did I know that steel is 5 on the Mohs hardness scale, and glass is 7. So I used the gas stove in the kitchen, heated up the tip to harden it. I put it back on the glass plate and bang, first shot, the glass broke."

Under a big sky

"I remember sitting there in the courtyard, looking up at the Tipuana tree against the blue sky, and wondering what all that meant," Ivan continued. "Now I had an idea that worked; the Safe-T-Punch. I get a lump in my throat when I explain what it means, but I knew its impact was going to be huge. It's not just a device on a piece of glass. It's a methodology that guarantees you can get out.

"I took it to the Council for Scientific and Industrial Research in South Africa. They did some load cell tests, measured how hard 12-year-old kids could hit; at that age, they reasoned that a child was old and clever enough to save themselves.

"And in the laboratory, you're at your most deactivated; in an emergency, with the adrenaline flowing, people are stronger, so if someone could break the window in the lab, that was a great sign. They did the experiments using real bus windows, and said it had the potential to save many lives in an accident.

"Through a contact at the City Council of Johannesburg, I got a meeting with the mayor and explained how the idea had come from the Westdene Bus Disaster. The mayor agreed that the city's school buses should be fitted, and my first order was

"...solutions often relied on assumptions about human strength, positioning, and tool availability in high-stress situations."

7.6.8.2.2 - Guarantees glass breakage and clearance within 20 seconds by one person.

7.6.8.2.2.1 - Permanently fixed directly on or next to the window at point of use.

7.6.8.2.2.4 - Requires a deliberate single action to activate; prevents accidental use.

7.6.8.2.2.2 - Clearly visible, red-marked, with immediate emergency identification.

7.6.8.2.2.3 - Always present, non-powered, and secured against removal or misuse.

7.6.8.2.2.5 - Fully effective through plastic films without loss of performance.



Safe-T-Punch™

Nothing more, nothing less -
just pure UN ECE R107 Rev10 compliance



Management
System
ISO 9001:2015

www.tuv-rheinland.com
ID: 80002371



DAKKS

Deutsche
Akkreditierungsstelle

Safe-T-Punch™ is the one emergency window break-glass device that never goes missing. Fixed in place, always visible, always ready, it's there the moment you need it most. No searching. No guessing. No failure points.

PLR DISTRIBUTION
(PTY) Ltd

EVAM UK

ENGINEERED FOR
EVERY JOURNEY.
PRECISELY.



0345 520 5160

Grand Tourer 11-19 Seater Luxury Minibus

The Grand Tourer delivers first-class travel, combining comfort, style, and practicality. Its spacious interior provides generous legroom for every passenger, while the coach-style powered door ensures smooth, effortless access. With side lockers on both sides, luggage can be stored conveniently and securely—making every journey as seamless as it is refined.





The unit is attached to the glass using strong adhesive tape. **SAFE-T-PUNCH**



The device can shatter glass with minimal force. **SAFE-T-PUNCH**

for 1,000 devices.”

By the mid-1990s, more regulations were starting to more closely define emergency exit provision, Ivan explained, including across Europe. Over the years, numerous bus and taxi accidents – many involving vehicles entering water or fire conditions – have highlighted the importance of reliable emergency egress, with hundreds of lives lost where escape proved difficult.”

Slow uptake

It would take Ivan many years of campaigning until South Africa introduced more stringent requirements for emergency exits for all buses first registered after 1 July 2009, which defined features such as a knock-out window or knock-out panel, but political and other reasons meant the product struggled to gain traction at first, Ivan explained, leading him to look further afield to market the device.

A deal in the 2000s with Wrightbus saw the product fitted to its lightweight Streetlite single-decker, going on to be adopted by manufacturers in Europe and beyond. “Wrightbus started fitting our devices, and we started supplying MAN and Daimler Buses,” recalls Ivan.

Since starting with Wrightbus in 2009, Safe-T-Punch now also supplies MCV, as well as MAN and Daimler, and also provides emergency egress equipment for plant and machinery in Canada. “We’ve now also got approvals for Alstom trains in India,” Ivan explained, “after we demonstrated a version that works on double-glazed windows at Innotrans in Berlin.”

As adoption has grown, similar-looking products have entered the market. However, Ivan says that visual similarity does not necessarily reflect equivalent engineering, certification, or performance: “In safety-critical applications,

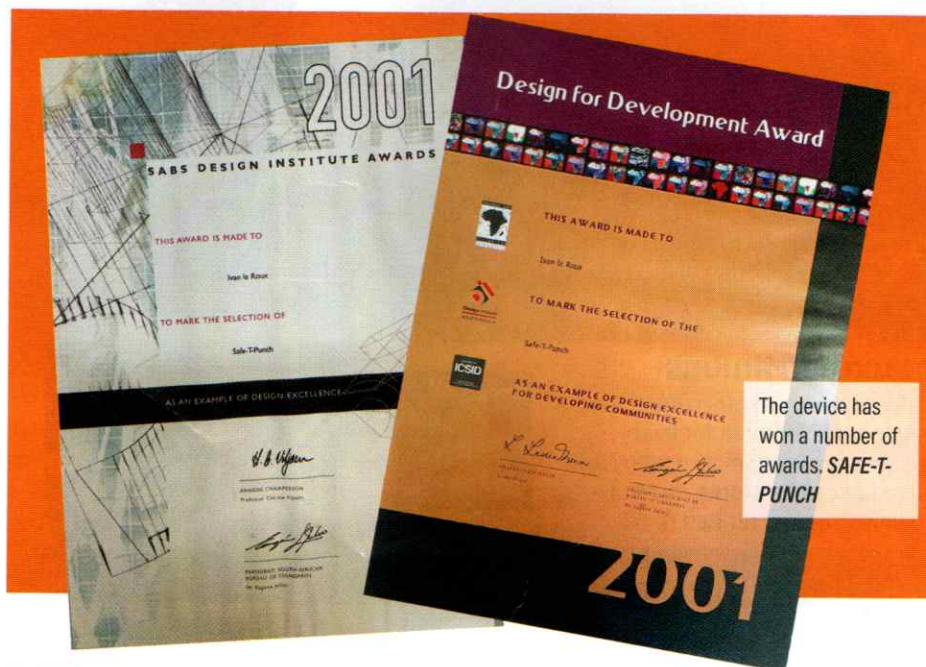
consistency and proven performance remain the key differentiators,” he said.

Scientific approach

Since his original concept, Safe-T-Punch has been through a number of revisions and is available to suit multiple applications. “Safe-T-Punch operates on a controlled force-transfer principle,” Ivan explained. “A hardened tungsten carbide tip concentrates approximately 3 Joules of user-applied energy into a highly localised impact, sufficient to penetrate the compression layer of R43 toughened glass.

“Because toughened glass is a standardised product, we can guarantee that a Safe-T-Punch will work, and with a large safety margin. Our lab tests proved that. And even if it didn’t, it’s repeatable because it doesn’t fall off. Unlike a hammer, it will hit the same spot on the glass every time. We’ve trialled it with people in awkward positions and using their weaker hand, and they still broke the glass after a few hits. And it doesn’t need batteries or maintenance. Everything is calculated back down to a molecular level: the right materials, the right shape, placed in the right position, held with the correct force, and deactivated with a single activation device against inadvertent bumping against and breaking windows. Once activated, it’s a natural action.

“Everything’s been designed in a completely scientific manner. We don’t believe there can be a simpler format. It only has the parts that it needs, no more, no less. We make them using ABS, an automotive-recognised plastic, and it’s mass-reproducible.”



The device has won a number of awards. **SAFE-T-PUNCH**

From the outside, the device can be identified by the black backing of the instruction sticker on the glass. **RICHARD WALTER**



Millions sold

"Since we started with Wrightbus in the UK, we've sold well over a million devices," Ivan explained. "In fact, everybody who works here has got one on the back window of their car too. Everybody hopes you would never, ever need it. But there's something to it when you look in the rear view mirror and know that if you end up on your side or upside down, you know you can escape through the window."

"I look at some of the fires caused by lithium ion batteries in electric cars, as well as those cases where cars with electric door opening have trapped people inside after an accident and can see a growing market. Modern cars are strong; you can have a high-speed accident and survive inside, but what good is that if you can't get out?"

Ivan also referred to an accident in France where a coach collided with a fuel tanker, causing the deaths of over 40 people. "The investigators found all the hammers were in a bundle under the driver's seat," he said. "because France had a bylaw that said that at the driver's discretion, he may remove the hammers if he thinks that they are at risk of being stolen. They've abolished that now."

Sticky stuff

Whilst some people might think the device is built into the glass, it's actually attached using a strong adhesive. "We use 3M's 4936 adhesive," explained Ivan. "It's the

There design relies on simplicity, using just a sharp point to shatter the glass. **SAFE-T-PUNCH**



world's very best double-sided tape. It's like a limpet; removal is impossible and installation is permanent. The permanence is guaranteed by the natural limpet-style design. It takes at least 56 kilogrammes of shear force to remove it from the glass, but you can't get purchase on it; it's impervious to the kind of tools someone might carry in their pocket or handbag, and it's protected against inadvertent activation with a safety tag, which needs a single action to remove. Even with the tag in place, if you hit the device hard enough, you can still break the glass. So it's not just fail-safe, but fail-active.

"Even the instruction stickers have also been designed to tight specifications. People think it's just a sticker, and wonder why it costs so much money, but its

made out of grade C photo-luminescent material, designed specifically for bus emergency exit advertising. It's specially made and it's not cheap. When the lights are out, it glows enough that you can actually visibly see your hand in the light that it produces. And no language is used on the stickers, it's all pictograms."

And at a time when costs are increasingly under the microscope, Ivan pointed to the savings in both time and money with a Safe-T-Punch system compared to emergency hammers, which require inspection and replacement if stolen. A single Safe-T-Punch device costs around 230 rand, or £10, Ivan explained. "You simply cannot make a simpler system than Safe-T-Punch," he explained.

"To me, it's like a no-brainer. It should be everywhere. It's inexpensive. It's a benign product. It's an artefact of certainty. It's recognisable. It glows in the dark. It doesn't need batteries, springs or levers. It's all mechanical and straightforward, and if ever it doesn't work the first time, you can keep going."

Today, Safe-T-Punch is installed across a wide range of bus, coach, rail, and specialist vehicle platforms globally. Its continued adoption reflects a broader shift in the industry: from reliance on assumptions and manual tools, toward engineered solutions that deliver predictable performance under real-world emergency conditions.

"In safety-critical design, certainty matters – and increasingly, so does the ability to deliver it consistently," Ivan concluded. //