

# NEWSLETTER

@REALFORENSICS

Shout out  
From

No two firearms  
leave the same mark...



## Lucas Visser

Operational Director & Forensic Specialist

I am an independent Forensic Firearm and Tool Mark Examiner with over 37 years of experience in forensic casework, crime scenes, court testimony, and presenting training in all aspects of Firearms and Toolmark Examinations. I have retired as Chief Forensic Analyst with the rank of Lieutenant Colonel from the Forensic Science Laboratory of the South African Police Service.

I am passionate about forensic science because I see it as a double-edged sword, a tool of justice. On one side, it exposes evil, and on the other, it points out injustice, where a person is falsely accused. In a country where crime has become part of our daily lives, victims and witnesses are often too afraid to testify, and forensic evidence has become more important in the criminal justice system.

I will always speak with a sense of pride, gratitude, and passion for the opportunities I have had in my career to learn from the best in the field.

**My statement:** "No two firearms leave the same mark. There will always be firearms, and as long as there are firearms, there will always be a need for somebody to use the expertise of a Ballistic expert."



## What's New?

Jannie (Wessie) van der Westhuizen appeared again on Groot FM's "GROOTtrauma" on May 22, 2024, alongside expert Johan Fourie, a collision reconstructionist. Thank you to presenter Pieter Cloete for inviting us again.

Wessie described Johan Fourie's discussion as excellent, emphasizing that it is a subject people should become more aware of. Wessie expressed his gratitude towards Groot FM, stating it was a privilege to be on the program. Thank you, Groot FM.

Double Click to listen



## DID YOU KNOW?



Luminol is used at crime scenes to detect small amounts of blood. It reacts with iron in the haemoglobin and emits a blue light.



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# Meet Johan Fourie

a Collision Reconstructionist



*Johan Fourie* was born in Pretoria, grew up in Kempton Park, and studied at RAU, where he met his wife, Kathleen, to whom he has been married for 43 years. They have two sons and two grandchildren, with a third one on the way.

Johan taught school for a while, but he suspects that both he and the Department were equally grateful when they parted ways. After that, he worked in the Office of the President for several years, including six years abroad. He then started his own business. He received training in collision reconstruction at the CSIR and completed a course at the Wingfoot Training Academy of the Goodyear Tire and Rubber Company.

In 2007, he and his partner, Johan Uys, founded SAFITI and have since entered into strategic agreements with real specialists in their respective disciplines, such as forensic metallurgy, mechanical engineering, fire investigations, ballistics, electrical engineering, and electronic collision data analysis.

Over the past decades, Johan has conducted investigations in several African countries, including Algeria, Egypt, Ethiopia, Djibouti, Togo, Cameroon, Burkina Faso, Liberia, Uganda, and Swaziland. SAFITI has also conducted investigations in Mauritius and offered a collision investigation course in Egypt, Singapore, and Mauritius. Additionally, SAFITI has made presentations at international conferences in Lyon, France, Sun City, and Sandton.

SAFITI is growing with technology, and Johan has already started to read collision data from vehicles and make use of 3D scans of vehicles.

## INTRODUCING OUR NEW PRIVATE INVESTIGATOR

# SAREL BOTHA

Private Investigator, Consultant, Assessor and Risk Analyst

After completing his school career at High School Piet Potgieter in Mokopane, Sarel enlisted with the South African Police in 1985.

Upon resigning from the SAPS in 2001, he became a Director of GASARC Mining & Industrial Supplies, a local gas company in Mokopane, and also managed a bottle store, Cheap-Cheap Bottle Store, in the same town.

In 2009 and 2010, he gained experience in the private security industry as General Manager and Head of Investigations at Strike Force Security in Mokopane.

Sarel was attached to the Private Security Industry Regulatory Authority (PSIRA) for 13 years until May 2023, where he was involved in the Law Enforcement Division. From March 2019, he was also part of a national six-member Priority Cases Investigation Team, initially operating from Pretoria on a national level and later from Durban on a provincial level in KwaZulu-Natal (KZN).

During his tenure, he dealt with various investigations, including alleged murder and attempted murder, assault with the intent to cause grievous bodily harm (GBH), fraud, and identity theft.



Sarel also addressed general aspects related to the Code of Conduct for Security Service Providers, with the majority of contraventions concerning non-compliance by security service providers towards the state, the authority, clients, and the public.





PSIRA successfully opposed two interdicts by a service provider attempting to lift its registration suspension. Sarel handled no fewer than 14 investigations, with one of his most intensive investigations leading to a direct income of R3,000,000 in early 2020, followed by another million rand in September 2020. He was assigned to conduct investigations related to taxi conflicts, political murders, and most investigations with the HAWKS. In his 13 years of employment, he lost fewer than three code of conduct hearings, a commendable track record.

Currently, Sarel is self-employed, working as a Private Investigator, Consultant, and Risk Analyst within the security sector. He is registered with PSIRA and has received training in all five standard grades (E to A). He is also appointed by WESCO Forensic Services to serve on its panel of service providers.

# TOPIC OF THE MONTH

## Vehicle Collisions: Vehicle Roadworthiness

By expert Johan Fourie, a Collision Reconstructionist

This may sound like an uninteresting subject, but during our three decades of collision investigations, the roadworthiness of vehicles has proven to be a serious problem in fatal collisions. We will limit the discussion to three aspects: tires, brakes, and suspensions.

### Wheels and Tires

*... using different tires on a vehicle is a very bad idea.*

While it is unfortunately not illegal in South Africa, using different tires on a vehicle is a very bad idea. Ideally, all four corners of a vehicle should have the same brand, model, size, load speed rating, and date of manufacture. Tires are designed to work together as a unit. Different brands and even tread patterns achieve different levels of mechanical traction, deflection, and water displacement. Additionally, braking, cornering, and acceleration will differ on each of the differing tires. Driving a vehicle with different tires on the two corners of a single axle is like running a marathon with a running shoe on one foot and a safety boot on the other.

One aspect of a tire that is often overlooked is the inflation pressure. Many motorists fail to maintain adequate pressure in their tires. An underinflated tire will cause the contact patch of the tire to become concave. With a very limited area of contact (about as big as a size 9 men's shoe) for a medium family sedan, one cannot afford to limit such a contact patch. On a wet road, it will not displace water properly, causing the vehicle to run on the inboard and outboard edges of the tires and eventually hydroplane, as there will not be enough tread to displace the water and provide mechanical traction. Refer to the attached graphics to see what underinflation does to the area that is supposed to displace water from the road.



Photo A. of a properly inflated tyre traversing a glass plate shows a high level of contact and water displacement.



Picture B. shows an under-inflated tyre and the concomitant lack of water displacement.

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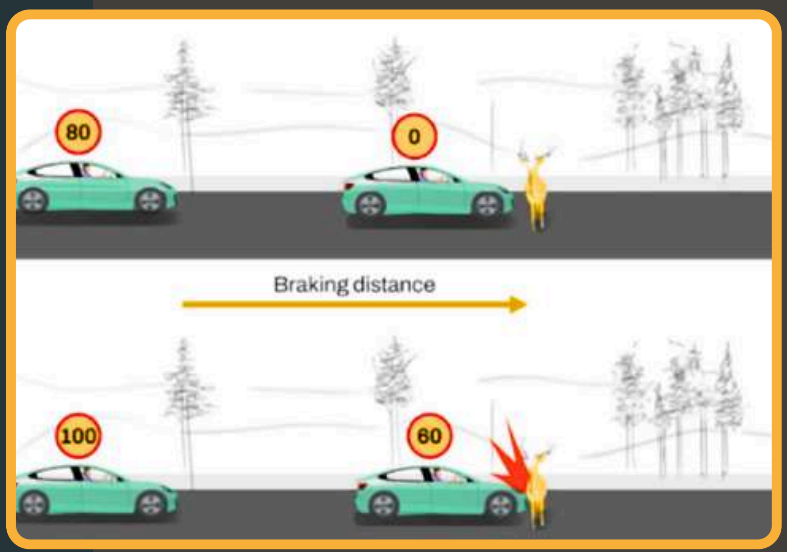
A dramatic and tragic example of tire failure occurred in the vehicle in which Madiba's great-granddaughter died. The vehicle was fitted with three tires that were compliant with its specifications, but a fourth tire, a second-hand one, was fitted illegally by a fitment center. This tire was severely worn on the inboard side and had a slow leaking puncture. While negotiating a right-hand bend, the left rear tire delaminated, pulling the vehicle to the left and into a retaining wall, causing the driver to lose control.

# Brakes

*Having good serviceable brakes is a legal requirement.*

Having good serviceable brakes on a vehicle is not only necessary but is a legal requirement. Note that modern vehicles can brake at levels of up to, and over 10,0 m/s<sup>2</sup>. If the brake pads are worn or the brake fluid is dirty or the setup is incorrect, this may be reduced markedly. For instance, a vehicle braking at 10,0 m/s<sup>2</sup>, can come to a complete stop from 100km/h on a level, tarred road within 36 metres. If the acceleration rate is brought down to 9,0 m/s<sup>2</sup> by virtue of poor maintenance the stopping distance will increase to 42 metres. Travelling at 100 km/h the 6-metre stopping distance difference means that where the first vehicle in the example stopped, the second vehicle would still be travelling at over 30 km/h. The initial velocity is critical in determining the stopping distance as the figure on the right illustrates.

Photo credit Johan Fourie



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In a fatal incident in Limpopo, the driver of a double cab pick-up truck, fitted with a sunroof, had a 12-year-old girl standing on the seat with part of her body protruding through the sunroof. The driver braked on a dirt road to turn left onto a tarred road. The braking setup, which had been incorrectly serviced the previous day, caused the vehicle to pull to the left. In a panic, the driver pressed harder on the brakes, causing the vehicle to slide onto the tarred road and tip over. The 12-year-old girl was ejected and killed.

*Regular check-ups are important.*

# Suspension

We do not wish to provide a long explanation of the importance of a proper suspension setup. The most obvious control element within the driver's reach is the shock absorbers. When the vehicle starts to pitch forward and backward when coming to a stop, it usually indicates that the shock absorbers are not functioning properly. Poorly functioning suspension can also be identified by irregular wear on the tires. Regular check-ups of the suspension and steering setup, as well as the shock absorbers, are important.

Photo credit Johan Fourie





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In a fatal incident in Mpumalanga, an overloaded pick-up truck had difficulty maintaining control on a steep downhill slope. The setup of the suspension, particularly the shock absorbers, did not provide adequate stability and was further compromised by the overloading. In a left-hand curve, the vehicle experienced a weight shift to the right. The right front shock absorber was of a different type than the rest on the vehicle and was also shorter, clearly indicating a typical "backyard" repair. The shock absorber failed, causing the vehicle to tip over and resulting in the deaths of the driver and a passenger.

This graphic shows the forces acting on the vehicle in a curve to the left. The red arrow shows the direction of the weight shift. The blue arrow shows the direction in which the weight shift acted on the vehicle and the dipping of the right front of the vehicle because it was not supported by a properly functioning shock absorber. The green arrow shows the retardation to which the vehicle was subjected. The retardation exacerbated the weight shift and caused the vehicle to tip over.



Below is just one example of the remarkable work forensic specialists do in cases involving vehicle accidents.

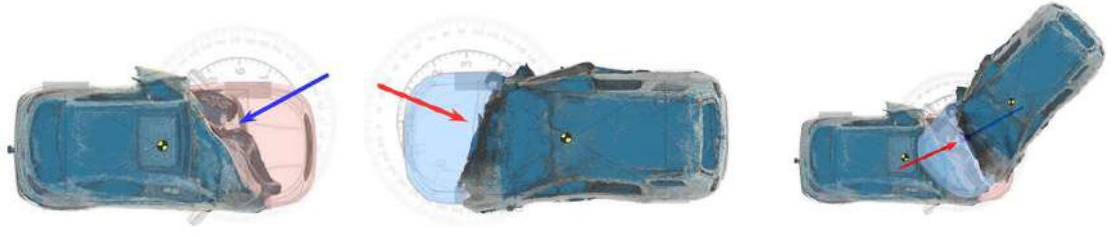


Photo credit Johan Fourie

# Important!

**Be Pro-Active.  
 Be Safe.  
 Stay Alive.**

People are primarily responsible for their own safety when driving. Long before blame can be shifted in an accident, drivers and vehicle owners must ensure their vehicles are safe. WESCO implores everyone to regularly inspect and maintain their vehicles, focusing on tires, brakes, and suspension. This not only protects their own lives but also the safety of other road users. Proactive vehicle safety is essential for preventing accidents and ensuring safer roads.

- ✓ Online courses for Farmers, Neighborhood Watches, & Members of Private Groups Fighting Crime (This workshop aims to empower citizens to support law enforcement by preserving evidence and fostering swift responses to create safer communities.)
- ✓ Online courses for Attorneys and Advocates (Comprehensive training covering the intricacies of firearm analysis, tool-mark identification, and ballistic evidence interpretation.)
- ✓ Online courses for Security Members & Other Stakeholders (An opportunity to revolutionize your skills and protect crime scenes effectively.)

*Don't miss out!*

*Be on the Look out for our exclusive interview with Lucas Visser.*

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