

Road Collision Investigation Project

Safety Advice Notice 2021-02: Motorcycle jackets, intervention times and standards

Issued: 2nd November 2021

1.0 Safety issue

Motorcyclist airbag vests and jackets can prevent certain types of injury in the event of a collision. Research identifies that some of the airbag vests available to UK consumers will not activate and inflate in time to do so. While there is a stated maximum intervention time of 200 milliseconds to achieve British Standard EN 1621-4:2013, there is currently no requirement to comply with this standard.

2.0 Safety advice

The Office for Product Safety and Standards is encouraged to evaluate and address the availability of sub-standard motorcycle airbag jackets/vests to UK consumers.

3.0 Issued to:

- The Office for Product Safety and Standards

4.0 Background

4.1 Project background

The Road Collision Investigation Project (RCIP) is funded by the Department for Transport and National Highways. It is coordinated by the RAC Foundation. The project seeks to establish whether there is a business case for putting more resource into the investigation of road crashes, based on a comparison with the approach to crash investigation used for other modes (Rail, Air and Sea) and safety critical industries (Oil & Gas) which suggests there could be a critical gap in the feedback cycle from the investigation of individual incidents through to the development of policies and strategies to reduce the incidence of crashes and mitigate the severity of those still happening.

[RAC Foundation - Road Collision Investigation Project \(RCIP\)](#)

RCIP safety advice notices are intended to draw attention to potential collision trends or safety issues identified from RCIP investigations of recent historical collisions, that a relevant group or organisation may wish to consider. Safety advice notices focus entirely on safety learning and do not in any way suggest or infer culpability or blame.

4.2 Safety issue background

Motorcyclist Personal Protective Equipment (PPE) offers riders a higher level of protection in collisions than clothing which would not be considered dedicated motorcycling equipment. Research has indicated that the chances of injury are reduced when PPE is worn,¹ and that

fully or partially protected riders spent fewer days in hospital and were at a reduced risk of disability or experiencing a decrease in physical function.²

Manufacturer testing has suggested that a rider wearing an airbag jacket could receive less fatal and serious injuries than those not wearing an airbag jacket.³

A review of tests performed on airbag jackets has concluded that the protection offered may mitigate life-threatening injuries.⁴

An in-depth investigation of several motorcycle collisions conducted by the Road Collision Investigation Project has identified the following area of concern.

Some airbag jackets on the market have an insufficient intervention time (the combined activation and inflation times) for certain types of collision and there is no recognised safety performance standard.

5.0 Legislation

5.1 Legislation and safety regulations

Motorcycle PPE, with the exception of helmets, are not legally required to be worn by riders on UK roads. Any motorcycle clothing labelled as PPE however has to conform the British Standard EN17092.⁵

BS EN 1621-4:2013 defines '*Motorcyclists' protective clothing against mechanical impact - Motorcyclists' inflatable protectors. Requirements and test methods*'.⁶

While there is a stated maximum intervention time of 200 milliseconds for airbag jackets and vests to achieve this standard, there is currently no requirement for compliance.

6.0 Supporting evidence

The RCIP project has investigated multiple fatal collisions involving a motorcyclist. In several of these collisions an airbag jacket would likely have significantly improved the rider's chances of survival.

The following information is provided by some airbag jacket manufacturers. It is likely that these manufacturers may have conducted the testing for these activation and inflation times 'in-house' without independent assessment:

- Helite are one such manufacturer of airbags jackets, and claim that their jackets offer "optimal" protection, inflating in under 100ms.⁷
- The instructional manual for the 'D-air Smart Jacket' by Dainese states that inflation time can vary according to the circumstances and environment.⁸
- RST claim that their airbag jackets and suits have an activation time of under 60ms.⁹

Research from TRL⁴ has revealed that the intervention time (i.e. the combined activation and inflation times) for several airbag jackets on the market are insufficient. They identify that while these jackets have the ability to reduce injuries, the variance in intervention times amongst manufacturers means the 'real world' effectiveness will vary greatly. They further identified that to be effective in a motorcyclist to vehicle collision an airbag jacket must inflate within

100ms. Manufacturer claims from seven of the fifteen airbag jacket specifications reviewed by TRL did not meet this threshold. Five of the fifteen did not meet BS EN 1621-4:2013 requirements, while three did not meet the threshold for a 'low-side' collision, which was determined to be 320ms. Information about the manufacturers of the respective airbag jackets was kept confidential.

There are currently no national standards for airbag jacket activation time which manufacturers are required to comply with. This may be one of the reasons for the observed variance in inflation time performance.

A minimum performance standard should be considered to ensure that all airbag jackets/vests available to motorcyclists meet a minimum intervention time threshold.

6. References

¹ de Rome, L. (2018). *Stars or Standards? A review of motorcycle protective clothing from the southern hemisphere*. RAC Foundation: London. Accessed 5 July 2021 from https://www.racfoundation.org/wp-content/uploads/Stars_or_standards_a_review_of_motorcycle_protective_clothing_Liz_de_Rome_December_2018.pdf

² de Rome L., Ivers R., Fitzharris, M., Haworth, N., Heritier, S., Richardson, D. (2011). *Effectiveness of motorcycle protective clothing: riders' health outcomes in the six months following a crash*. DOI: 10.1016/j.injury.2011.10.025. Accessed 22 June 2021 from <https://pubmed.ncbi.nlm.nih.gov/22192472/>

³ Motorbike Times (2014). *Helite announces airbag jacket safety statistics*. Accessed 5 July 2021 from [http://www.motorbiketimes.com/news/gear/helite-announces-airbag-jacket-safety-statistics-\\$21383252.htm](http://www.motorbiketimes.com/news/gear/helite-announces-airbag-jacket-safety-statistics-$21383252.htm)

⁴ Barrow, A., O'Connell, S., Martin, P., Hynd, D. (2018). *Injury Mitigation Potential of Inflatable Protective Motorcycle Jackets*. TRL. Accessed 5 July 2021.

⁵ BSI (2020). *BS EN 17092-6:2020: Protective garments for motorcycle riders. Class C garments. Requirements*. Accessed 5 July 2021 from <https://shop.bsigroup.com/ProductDetail/?pid=000000000030353398>

⁶ BSI (2013). *Motorcyclists' protective clothing against mechanical impact - Motorcyclists' inflatable protectors. Requirements and test methods*. Accessed 20 August 2021.

⁷ Helite (2021). *MECHANICAL AIRBAG SYSTEM*. Accessed 5 July 2021 from <https://en.helite.com/airbag-technologies/mechanical-airbag-system/>

⁸ Dainese (2021). *D-air Smart Jacket - Informative Note (OTHER)*. Accessed 5 July 2021 from <https://dainese-share.thron.com/content/?id=1435d101-2dbd-4350-bbf2-403dc8ad06&pkey=dlcrnc>

⁹ RST Moto (2021). *Integrated airbag range*. Accessed 5 July 2021 from <https://www.rst-moto.com/rst-airbag-collection>