

About Us

Brotherwood was founded in 1985, our aim to provide comfortable, inclusive and safe transport for wheelchair users.

The experience that we have amassed in this specialised market drives our development to design better, safer solutions for our clients.

Our engineers continually strive to improve our products, and as a result transport for wheelchair users has made enormous strides in comfort, inclusion and safety in the past 40 years.

We are often asked questions regarding the safety of our products and how they are tested. We have produced this guide to help simplify what the jargon, acronyms and terms used in the WAV industry actually mean.

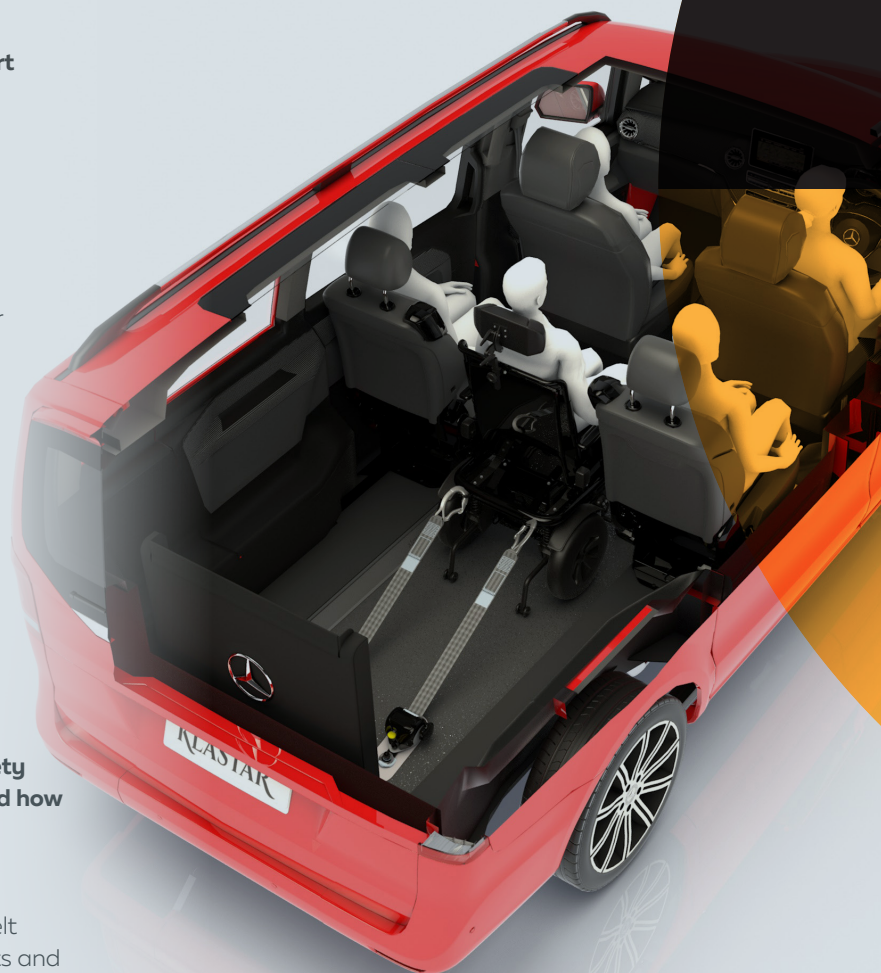
WAVs v Standard Cars

To put Wheelchair Accessible Vehicle (WAV) safety testing into context it is important to understand how standard cars are tested for their safety.

All passenger carrying cars (M1 type vehicles) are subject to testing on their Seat Belts and Seat Belt Anchorages. The regulations which test Seat Belts and their fixings are called UN Regulations No 14 & 16.

Car manufacturers must test the Seat Belts and Anchorages in their vehicles to pass the **minimum standard** set by these regulations, in which vehicles are crash tested at **48 kph (30mph)** using a **78kg** Anthropomorphic Test Dummy.

Many drivers are well over 78kg, and almost all will exceed 30mph. However this is universally recognised as the minimum standard.



Watch our video guides to learn more about safe use of our range of vehicles

[Brotherwood.com/aftersales/using-your-wav/](https://www.brotherwood.com/aftersales/using-your-wav/)

Every effort has been made to ensure that the information given is correct at time of production. This information is intended for use as a guide and should not be used in place of any official regulation.

Testing & Safety

for Wheelchair Accessible Vehicles

No statistics or evidence show that wheelchair users are at any greater risk than other motoring passengers when travelling by car.



BROTHERWOOD®

ENGINEERING TO ENABLE



Wheelchair Accessible Vehicles (WAVs)

Wheelchair Accessible Vehicles are standard vehicles which have been converted to accommodate a wheelchair user who has to remain seated in their wheelchair whilst travelling.

Wheelchair Accessible Vehicles were first officially recognised under EU Regulation as a specific category of Special Purpose Vehicle (SPV) for Type Approval in October 2007.

In order to supply a vehicle officially Type Approved as a WAV, the convertor must prove that it is fitted with a Wheelchair Tie-Down and Occupant Restraint System which has been tested to exceed the **minimum standard** prescribed under **ISO 10542** regulations.



Wheelchair Tie-Down and Occupant Restraint System (WTORS)

All Wheelchair Accessible Vehicles are fitted with some type of Wheelchair Tie-Down and Occupant Restraint System (WTORS). The purpose of WTORS is to provide safe restraint of both wheelchair and passenger during transport.

WTORS is tested according to a multi-part international standard called **ISO 10542**, whereby a WAV must undergo WTORS testing by simulating a **48 - 0 kph** near-instantaneous deceleration (sometimes referred to as a crash test).

In order to perform this laboratory test a surrogate **85kg wheelchair** is used, along with a **78kg Anthropomorphic Test Dummy** (ATD).

This process places a force exceeding 20g on the surrogate wheelchair and ATD - meaning the WTORS must be able to withstand a load equivalent to 20 times their combined weight.

As both electric wheelchairs and people continue to increase in size, Brotherwood and a number of leading WTORS manufacturers are working to develop new products to meet these greater loads. As a result, new products coming to market may now be additionally tested to weights exceeding the **minimum standard** required for ISO 10542 compliance.



Wheelchairs

The wheelchair is now officially recognised as a seating position within a vehicle.

It is recommended any wheelchair intending to be used as a forward facing seat in a vehicle should meet the **minimum standard** prescribed in **ISO 7176-19**, and be tested in accordance with **ISO 10542**.



Can My Wheelchair Be Used in a WAV?

Wheelchairs which have been tested to comply with **ISO 7176-19** typically carry the universally recognised anchor point logo above.

The WTORS must be attached to the wheelchair at the specified anchor points bearing the ISO 7176 anchor point logo above.

For more information regarding the suitability of a specific wheelchair refer to the wheelchair Operator's Manual or contact the wheelchair manufacturer for guidance.