Power Wheelchair

TRANSPORTATION SAFETY GUIDANCE DOCUMENT

AMYLIOR

Life is unpredictable...
your power wheelchair shouldn't be

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Transportation Safety Guidance Document

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1. Introduction

This document contains information on **AMYLIOR** crash tested power wheelchairs and describes the applicable standards to which they were tested. It also includes information on transit securement of an occupied wheelchair in a motor vehicle, on tie-down systems used during crash tests, as well as images of wheelchair securement points. **AMYLIOR**'s wheelchair tie-down system, made up of hook-type hardware (hooks, loops, carabiner clips, etc.), is used to attach to securement points.

Based on tests performed and results achieved, approved for transit **AMYLIOR** products withstand strong forces that occur during crash tests (in accordance with ISO 7176-19/RESNA WC-4, Section 19) and are therefore suitable to be used as a seat for the transportation of a wheelchair and its user in a motor vehicle.

A simulated crash test of a frontal impact performed in a test laboratory can in no way cover all accidental situations that occur on the road. Therefore, it is recommended that the wheelchair user transfers into the vehicle seat which offers, without a doubt, the highest level of safety while the vehicle is in motion; and that the wheelchair be securely stowed in a designated area.

Because of the high number of systems offered on the market, it is not possible for **AMYLIOR** to crash test all Wheelchair Tie-down and Occupant Restraint Systems (WTORS). However, all **AMYLIOR** crash tested wheelchairs, equipped with the ISO 7176-19/WC19 WTORS package, can be transported with any ISO 10542-certified WTORS.

In order to determine whether the system you have meets these requirements, contact the wheelchair manufacturer and/or the occupant restraint system supplier (see Page 10).

This document is intended to provide transit compliance information and guidance for the safe use of tie-down systems and securement points. If you have questions on using your wheelchair for seating in a motor vehicle, please contact **AMYLIOR** Technical Support at **1 888 453-0311.**

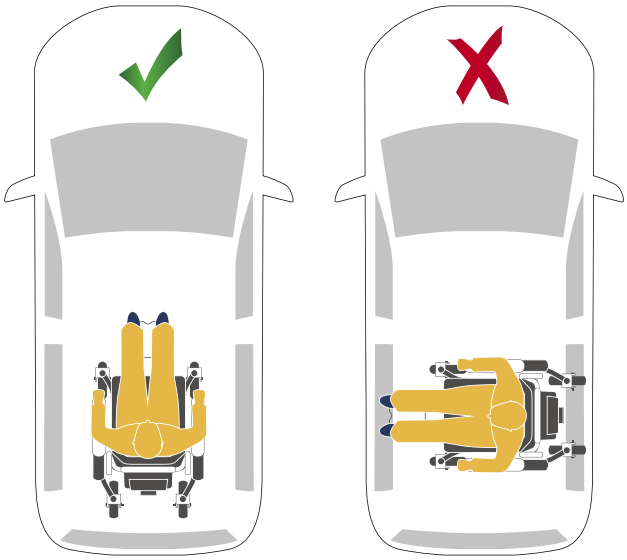
2. Transportation of a wheelchair in a motor vehicle

A wheelchair secured in a vehicle does not offer the same level of safety as the bolted-in seating system of a vehicle. Therefore, whenever feasible, **AMYLIOR** recommends that the wheelchair user transfers or is transferred into the vehicle seat and uses the vehicle-installed restraint systems (seat belt). If this is not possible and the wheelchair occupant must remain in the wheelchair while traveling in a vehicle, then these instructions must be followed:

1. The wheelchair and occupant must be forward-facing in the direction of travel and must be secured using the wheelchair **tie-down system**. The user's **occupant restraint system** must meet the ISO 10542 or SAE J2249 requirements. These systems must be fitted in accordance with their manufacturer's instructions as well as the wheelchair manufacturer's instructions (See checklist on page 9).

   The test standard in accordance with ISO 7176-19/WC19 only covers the transportation of wheelchairs in a forward-facing direction. This means that the wheelchair must never be transported in a side facing direction. (Fig. 1).

Fig. 1



2. All add-on components or accessories should be removed from the wheelchair and stowed safely.
   These include but are not limited to:

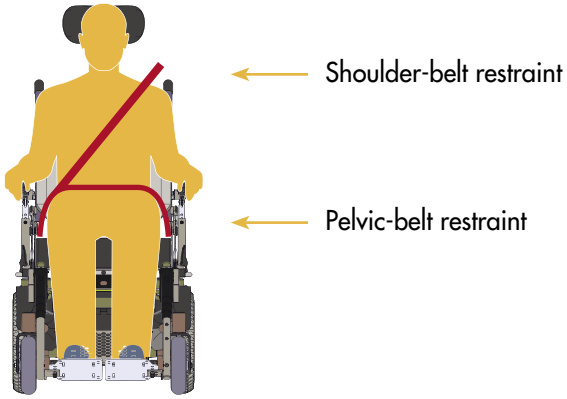
   Loose cushion – Tray Table – Vent Tray – Crutches – Hip and Thigh Supports – Bags

3. Alterations or substitutions must not be made to the wheelchair securement points or to the chassis/frame components without consulting the manufacturer. If modifications are made without the consent of the manufacturer, the wheelchair is no longer adequate to be transported in a vehicle and the manufacturer warranty is void.
4. When transported in a vehicle, a power wheelchair must be equipped with leak-proof, sealed batteries (e.g. gel batteries).
5. Should there be an accident or impact, the wheelchair must be inspected by an authorised wheelchair dealer before it is used again.

6. A combination of a pelvic-belt and a shoulder-belt must be used to restrain the wheelchair occupant (Fig. 2). With these restraints the possibility of head and chest impacts with any of the vehicles components is reduced. The shoulder-belt restraint must not lie across the neck or underneath the armpit but across the chest. The pelvic-belt restraint should be positioned just above the hipbone.

   The use of only a pelvic belt may compromise the performance of the wheelchair tie-down and occupant restraint system (WTORS), and increase the risk of serious or fatal injuries to the wheelchair occupant.

Fig. 2



7. A headrest suitable for transportation should be properly fitted and positioned at all times during transportation in a vehicle.
8. Standard wheelchair lap belts are not suitable.

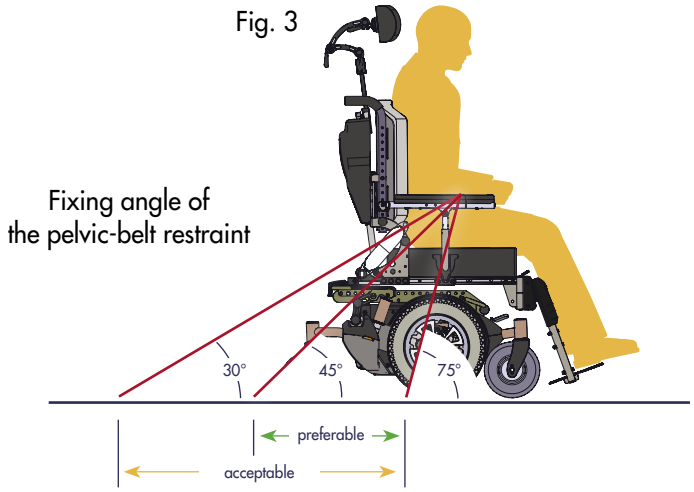
   Postural supports (lap straps, lap belts) should not be used or relied upon as occupant restraints in a moving vehicle unless they are labelled as meeting the requirements specified in RESNA WC-4, Section 18 (with successful performance in a 48 km/h (30 mph) frontal impact test).

OCCUPANT RESTRAINT INSTRUCTIONS

1. The wheelchair tie-down and occupant restraint systems (WTORS) must be fitted on the lower front side of the hipbone (Fig. 5) in a way that the angle of the pelvic-belt restraint is within the range of 30° to 75° to the horizontal (Fig. 3).

   A steeper (greater) angle of the belt is desirable but must never exceed 75°.

Fig. 3



2. Restraint belts must not be placed over wheelchair parts or obstructed by wheelchair components such as armrests or wheels so that they are being held away from the body (Fig. 4).
3. The shoulder-belt restraint must be fitted diagonally across the chest over the collar bone. (Fig. 6)
4. The occupant restraint belts must be as tight as possible, without restricting the user.
5. Restraint belts must not be twisted when in use.
6. Suitable headrests (strongly recommended) should be positioned correctly (Fig. 5).

Fig. 4

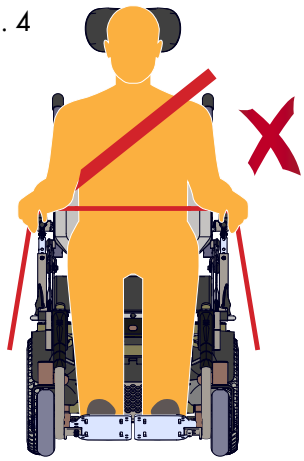


Fig. 5

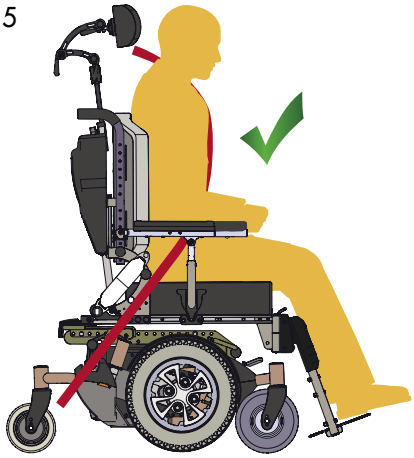
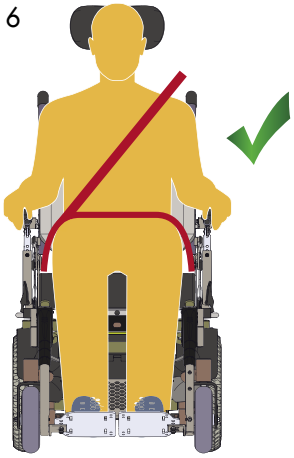


Fig. 6



3. AMYLIOR power wheelchairs approved for transportation in accordance with ISO 7176-19/WC19

AMYLIOR wheelchairs are tested in accordance with ISO 7176-19/WC19 with a hybrid III test dummy of either 75 kg (165 lb) or 100 kg (220 lb), forward-facing in the direction of travel with a frontal impact and a wheelchair tie-down system consisting of a 6-point tie-down system and a 3-point tie-down occupant restraint system for the wheelchair user (with pelvic and shoulder belts in accordance with ISO 10542).

Some of the variants of the models tested were assessed and deemed that they fulfill the dynamic test requirements because they have the same construction (i.e. the same frame resistance cover materials, rigidity, structural integrity of the components and connections) as well as geometrical similarity with the models which have been approved for transportation in a vehicle.

The products shown in the following table were tested in their standard configuration and with standard settings. It would be impossible to test **AMYLIOR**'s entire range of adjustable configurations and options.

The **AMYLIOR** power wheelchairs tested with a modified configuration, must be **selected at the initial purchase** to comply with ISO 7176-19/WC19 standards.

The following list of crash tested **AMYLIOR** products expands constantly. Please refer to the most recent version of this table on the *WC Transportation Safety* website and click the tab "Crash Tested Product Lists".

AMYLIOR POWER WHEELCHAIRS ARE FULLY COMPLIANT WITH ISO 7176-19/WC19 STANDARDS AS OF JANUARY 2017

The following link features the latest ISO 7176-19/WC19 compliance information:
http://wc-transportation-safety.umtri.umich.edu/crash-tested-product-lists/wheelchairs

	Name and Model	Configuration and Options	Weight capacity range
Alltrack Series	Alltrack M3 Series Alltrack M Series Alltrack R3 Series Alltrack R Series Alltrack P3 Series Alltrack P Series	• **Amyseat** Static Seat • Amyseat with Tilt • Amyseat with Recline • Amyseat with Elevate • Amyseat with Tilt & Recline • Amyseat with Tilt & Recline & Elevate	23 kg – 136 kg (51 lb – 300 lb)
	Alltrack M3 (HD) Series Alltrack M (HD) Series	• **Amyseat** Static Seat • Amyseat with Tilt • Amyseat with Recline • Amyseat with Tilt & Recline	23 kg – 205 kg (51 lb – 450 lb)
	Alltrack R3 (HD) Series Alltrack R (HD) Series	• **Amyseat** Static Seat • Amyseat with Tilt • Amyseat with Recline • Amyseat with Tilt & Recline	23 kg – 181 kg (51 lb – 400 lb)
Quickie/ Zippie	Quickie Xperience Quickie Xplore Zippie Xperience Zippie Xplore	• **Eclipse** Static Seat • Amyseat with Tilt • Amyseat with Recline • Amyseat with Elevate • Amyseat with Tilt & Recline • Amyseat with Tilt & Recline & Elevate	23 kg – 136 kg (51 lb – 300 lb)
	Quickie 747	• **SP-202** Static Seat • Seat with Tilt • Seat with Recline • Seat with Elevate • Seat with Tilt & Recline • Seat with Tilt & Recline & Elevate	23 kg – 181 kg (51 lb – 400 lb)
	Quickie 323	• **SP-202** Static Seat • Seat with Tilt • Seat with Recline • Seat with Elevate • Seat with Tilt & Recline • Seat with Tilt & Recline & Elevate	23 kg – 205 kg (51 lb – 450 lb)
	Quickie Xperience HD	• **Eclipse** Static Seat • Seat with Tilt • Seat with Recline • Seat with Tilt & Recline	23 kg – 205 kg (51 lb – 450 lb)
	Quickie Xplore HD	• **Eclipse** Static Seat • Seat with Tilt • Seat with Recline • Seat with Tilt & Recline	23 kg – 181 kg (51 lb – 400 lb)

4. History of applicable standards

1. **ISO 7176-19/WC19 Crash Test Standard –** The wheelchair crash test was derived from the crash test already used in the car industry. Wheelchairs are crash tested at a speed of 48 kph (30 mph) and an impact deceleration of 20 G. The test dummy is limited to a maximum weight of 75 kg (165 lb) and 54 kg (119 lb) for children. Only frontal impact has so far been simulated for wheelchairs.
2. **Wheelchair Tie-down and Occupant Restraint System (WTORS) in accordance with ISO 10542-2 –** There are various versions of WTORS that meet ISO 10542 requirements. The wheelchair is attached with loops, hooks, carabiner clips, buckle tongues or other means of securement. The WTORS itself is also tested by a dynamic crash test. To do this, a "surrogate wheelchair" is used. With this WTORS, particular attention is given to the weight that is being secured (wheelchair weight + user weight). For this reason, power wheelchairs (considered very heavy) must be secured in a vehicle using a 6-point tie-down system.

20 G FRONTAL CRASH

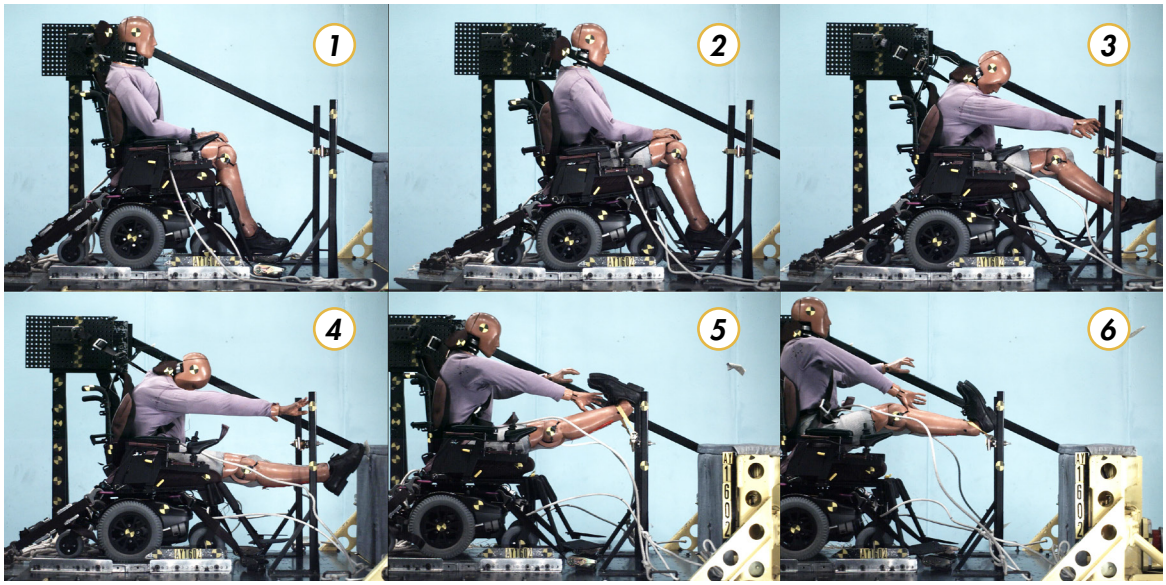
- ISO 10542-2, 3-point tie-down occupant restraint system;
- Person (75 kg/165 lb hybrid dummy) ISO 7176-19 Frontal Crash Test for wheelchairs as a seat in a vehicle (48 kph/30 mph, 20 G deceleration);
- ISO 10542-2 wheelchair tie-down system.

Power wheelchair tie-down system

Occupant restraint system

5. Crash Test Photos

These photos show you what happens during a wheelchair crash test.



6. Securement points for wheelchair tie-down systems on AMYLIOR products

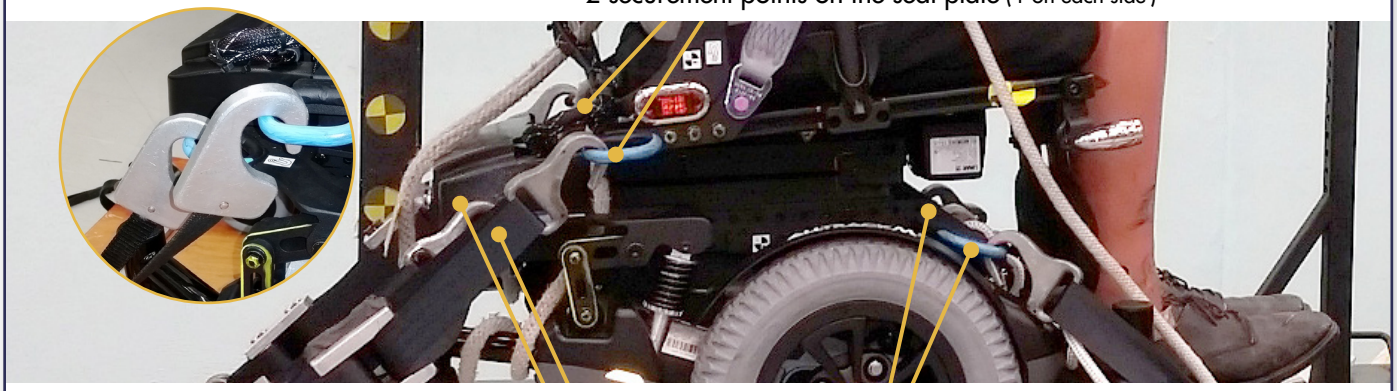
This section shows location of securement points for approved **AMYLIOR** products.

In accordance with ISO 7176-19/WC19, all securement points on the wheelchair are labeled with the relevant standard hook symbol. These labels show where to attach the wheelchair tie-down system hardware (hooks, carabiner clips, loops, etc.)

NOTE: For your **AMYLIOR** power wheelchair to feature the safety transport options shown, **the securement points configuration must be selected during the initial purchase.**

Attach securement points on both sides

2 securement points on the seat plate (1 on each side)



4 securement points on the base (2 on each side)

7. Checklist: Transportation of a person in a wheelchair

For those who transport and/or accompany the wheelchair user, we advise going through this checklist:

1. Whenever feasible, it is recommended that the wheelchair user transfers or is transferred into the vehicle seat and uses the vehicle-installed restraint systems (seat belt), and that the wheelchair be securely stowed in a designated area.
2. If the occupant must remain seated in the power wheelchair during transportation, consider the following:

   a) The wheelchair must be tested in accordance with ISO 7176-19/WC19 requirements. **AMYLIOR** wheelchairs that have been tested carry the relevant labels.


   b) Use only a suitable wheelchair tie-down and occupant restraint system (WTORS) in accordance with ISO 10542. This requires a 6-point tie-down system for power wheelchairs and a 3-point tie-down occupant restraint system.

   c) The wheelchair and user must be forward-facing in the direction of travel and symmetrically aligned over the vehicle's securement rails.

   d) All removable and loose parts such as tables, crutches etc, must be removed and stowed safely.

   e) If the wheelchair is equipped with freewheel or brake release levers, they need to be engaged.

   f) The wheelchair tie-down system is to be fitted to the wheelchair in accordance with the manufacturer's recommendations. The hook labels indicate the position of all securement points on the wheelchair. Attach the front straps on the wheelchair first. Release the levers. Pull the wheelchair back toward the rear to create tension and tighten the straps. Then attach the back straps making sure that they are tight by the wheelchair's traction. Re-engage the levers. The rear straps set the system under tension.

   g) After the wheelchair is firmly attached to the vehicle floor, the occupant restraint system should be fitted in accordance with the manufacturer's recommendations.When doing this, make sure that the shoulder-belt and pelvic-belt restraints are fitted securely. The belts must not be twisted nor pass over wheelchair components such as the sideguards, armrests or other edges, they must closely hug the occupant. The shoulder-belt should be positioned diagonally across the chest and over the collar bone away from the neck. The pelvic-belt must always be positioned just above the hipbone, not over the abdomen.

   h) A headrest, approved to ISO 7176-19/WC19 standard, should be fitted and positioned correctly.

   i) Finally, belts and straps should be checked one more time to make sure that they are correctly positioned:

      - Are the wheelchair straps firmly tensioned and fitted in the right place?
      - Is the pelvic-belt restraint positioned just above the hipbone?
      - Is the shoulder-belt restraint positioned diagonally across the chest and over the collar bone away from the neck?
      - Do the belts closely hug the body?

8. Manufacturers of WTORS (Wheelchair Tie-down and Occupant Restraint Systems) in accordance with ISO 7176-19/WC19

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