

Safety Tips

for Clients of Vehicle Modifiers

who will be riding as passengers in personal vehicles while seated in their wheelchair secured by a 4-point-strap-type tiedown system

WHEELCHAIR-TIEDOWN AND OCCUPANT-RESTRAINT EQUIPMENT

- 1) Check your wheelchair tiedown straps and the seat-belt restraints regularly:
 - Make sure that each tiedown-strap assembly and any tensioning or locking mechanisms are working properly so that your wheelchair is held securely in place.
 - Make sure that all equipment is clean and that anchorage hardware fastened to the vehicle floor, such as steel or aluminum track, is free of debris so that all tiedown strap and belt restraint anchorage components will effectively engage with and lock into vehicle anchor points.

If you notice problems with any equipment not functioning properly or if the restraint system is uncomfortable or not fitting properly, make an appointment with your vehicle modifier (your company's phone number here) as soon as possible.

- 2) If you plan to purchase a new wheelchair in the future, look for a wheelchair model that meets your needs and that also complies with industry wheelchair transportation safety (WTS) standards, commonly referred to as a ***WC19 wheelchair***.
 - These wheelchairs will have one or more permanent labels with words stating that the wheelchair complies with WC19, or will be permanently marked with one or more of the symbol shown below.



Symbols indicating compliance with industry wheelchair transportation safety standards

- A WC19-wheelchair will have four easily accessible brackets with rectangular openings for attaching hooks of the four tiedown straps, and will have been successfully crash tested using these brackets to secure the wheelchair with four tiedown straps.
- A WC19-wheelchair will have a rating from excellent to poor regarding how easy it is to properly position a vehicle-anchored three-point lap/shoulder belt restraint system on a passenger in the wheelchair. Select a wheelchair model with a “good” to “excellent” rating.
- A WC19-wheelchair will provide the option for a passenger seated in the wheelchair for using a crashworthy lap belt that is anchored to the wheelchair to which the lower end of a vehicle-anchored shoulder belt can be easily attached near the hip to complete a three-point lap/shoulder belt restraint system similar to that used by passengers in the vehicle seats.

SECURING YOUR WHEELCHAIR

- 3) Always secure your wheelchair to the vehicle **using all four tiedown straps**.
- 4) Check to make sure that all anchorages are securely fastened to hardware on the floor (such as a length of steel or aluminum track), and that all straps are attached securely to the wheelchair frame using WC19 securement-point brackets or portions of the wheelchair frame that have been identified and marked by you and your vehicle modifier.

NOTE: As illustrated below, for some wheelchairs that do not comply with WC19 and that have frames with large cross sections, you may need to permanently attach “securement loops” to the wheelchair frame to provide a way to easily and effectively secure the wheelchair.

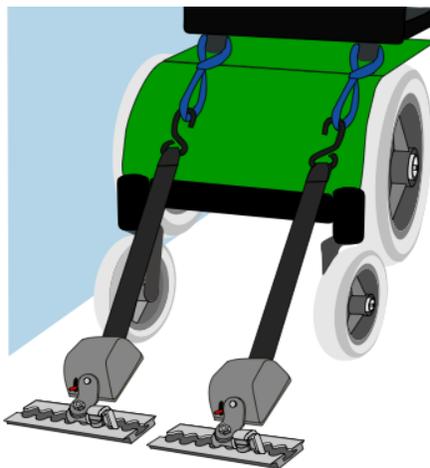
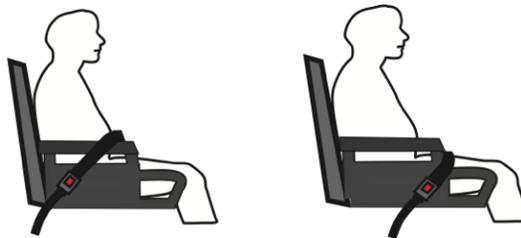


Illustration of securement loops attached to the back of a wheelchair frame to provide easily accessible places for attaching tiedown hooks

- 5) Make sure that all tiedown straps are tensioned and locked before traveling.

PROPER USE OF SEAT BELTS

- 6) Always use both the lap and diagonal shoulder portions of the seat-belt system when traveling in your vehicle.
- 7) Use postural belts and other types of postural supports attached to your wheelchair to help you sit as upright as possible, but **don't rely on these belts and supports for safety and crash-protection during travel.**
- 8) If you have a WC19 wheelchair and are using a crash-tested lap belt anchored to the wheelchair (indicated by a label on the belt stating that the lap belt complies with WC19 or by the circular symbol above), complete the three-point lap/shoulder belt restraint system by attaching the lower end of the shoulder belt to the pin-bushing anchorage on your lap belt.
- 9) Whether you are using a vehicle-anchored or wheelchair-anchored lap belt, properly position the seat belt on the wheelchair passenger by:
 - making sure that the lap belt is positioned low across the pelvis,
 - making sure that the shoulder belt crosses over the middle of the shoulder closest to the side of the vehicle and diagonally across the chest, and
 - placing the connection between the lap and shoulder belts near the hip opposite to the side where the upper anchorage of the shoulder belt is attached to the vehicle.
- 10) Never place the lap-belt portion of the vehicle seat belt over, or in front of, the wheelchair's arm supports as shown below since this will reduce ability of the seat belt to provide protection from serious injury in a crash and will increase the risk of serious injuries from restraint forces applied to the body by the seat belt.



Improper positioning of the lap-belt portion of a vehicle seat belt over (left) and in front of (right) wheelchair arm supports

- To achieve proper positioning of the lap belt low on the pelvis, it is best if your wheelchair has arm supports that are attached to the wheelchair at the back (for example to the back-support posts) so they are completely open in front and underneath as shown below.



Proper positioning of a vehicle-anchored lap belt with wheelchair arm supports that are attached to the back-support posts and completely open at the front and underneath

- For wheelchairs with arm supports that are connected to the wheelchair frame at the front so that it is not possible to slide the lap belt under the front of the arm supports, proper positioning of a vehicle-anchored lap belt can often be achieved by inserting the two halves of the lap belt into sufficiently large gaps between the arm supports and the back support.



Lap belt placed in gaps between arm supports and the back support to achieve proper positioning low on the pelvis

- For wheelchairs with arm supports that are not open underneath at the front but that can be rotated upward or sideways, this feature can be used to help achieve proper positioning of a vehicle-anchored lap belt in contact with the lower part of the pelvis.
- For some wheelchairs, achieving proper positioning of the lap belt low on the pelvis may require “threading” the stiffened anchorage ends of the lap belt through openings between the wheelchair back support and the seat on each side of the passenger.



Lap belt threaded into opening between the wheelchair seat

and back support to achieve proper positioning low on the pelvis

- 11) When ready for travel the seat-belt buckle should lie comfortably against the front of the pelvis and should not be in contact with, or close to, rigid wheelchair components that could contact and depress the buckle release button, or that could contact and break the buckle assembly during a crash.
- 12) Never sew, pin, tie, or otherwise modify the webbing of seat-belt systems.
- 13) Contact your vehicle modifier (your company's phone number here) if you are having any problems with proper seatbelt positioning or if the seatbelt is not comfortable.
- 14) If you have a rear head support attached to the back of your wheelchair, it is best if you can position the top of the head support at least as high as the ears and the front of the head support is as close to the back of the head as possible, consistent with comfort.



For more information on best practice in transportation safety for passengers seated in wheelchairs, refer to the *Ride Safe Brochure* provided by your vehicle modifier and to other educational materials that can be obtained online at wc-transportation-safety.umtri.umich.edu.