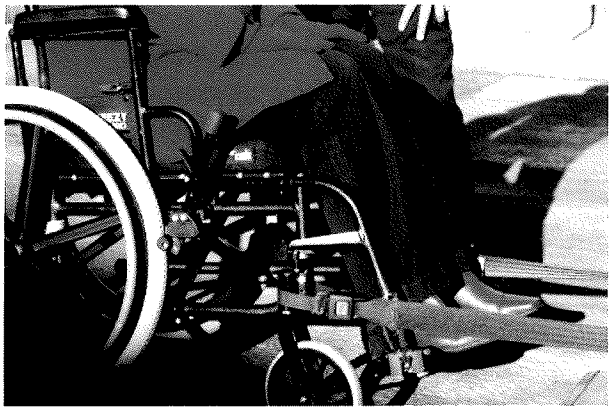
Winches

Some accessible vehicles are fitted with an electric winch to make it easier for a wheelchair user to board the vehicle using a ramp. Winches help to reduce the manual handling injuries that could otherwise result from pushing a heavy manual wheelchair user up a ramp.



Ensure that there is a strong and accessible point on the wheelchair frame to attach the winch cables to

You may be given specific instructions about using a winch for a particular wheelchair user. If not, follow the MiDAS general guidance below.

When using a winch:

- Follow the manufacturer's instructions at all times
- Ensure that there is a strong and accessible point on the wheelchair frame to attach the winch cables to
- Monitor the manoeuvre and stop the winch if you have any concerns
- Report any problems or concerns to your manager
- Report any defects promptly and, as with any item of safety equipment, make sure that the winch is not used until the defects are rectified.

Inside the vehicle - securing a wheelchair user for the journey

Introduction

It is important that passengers who travel in wheelchairs do so in safety and comfort. In most cases this is not difficult or complicated if appropriate equipment and well-trained staff are available. However, in some cases there are extra factors to take into account, such as the nature of particular disabilities, the design of some wheelchairs or the seating inserts, trays or other equipment fitted.

Terms used

- **Wheelchair tie-downs** is used to describe any type of equipment used to secure wheelchairs in a vehicle. So 'tie-downs' include 4-point webbing, older ratchet clamps and any other types of restraint or equipment used to secure wheelchairs.
- **Passenger safety belts and harnesses** is used to describe the passenger restraints or 'seat belts' provided for wheelchair users when they use their wheelchairs as seats in the vehicle. These are sometimes called passenger restraints or occupant restraints.

Sometimes both types of equipment are collectively referred to as Wheelchair Tie-down and Occupant Restraint Systems or "WTORS".

General principles or 'golden rules' for transporting wheelchair users safely

When passengers remain in their wheelchairs when travelling in a vehicle, there are four general principles that you must always follow:

- Ensure that the wheelchair tie-downs you are using are suitable for the type of wheelchair being secured.
- Provide the wheelchair user with a suitable safety belt or harness.
- Follow the manufacturer's instructions for the equipment being used.

- Follow any specific instructions you have been given for that wheelchair user.

Later in this section we look in more detail at the procedures to be followed.

Correct procedure for wheelchair users travelling in their wheelchairs

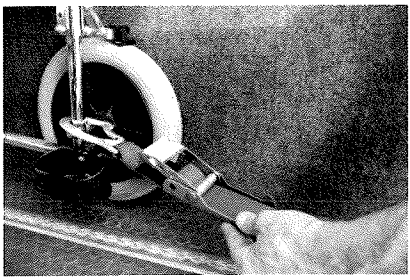
Here we look at the steps you need to follow to ensure that wheelchair users have a safe and comfortable journey.

The correct procedure is to:

- Check the wheelchair for obvious signs of damage before the wheelchair user boards the vehicle. A damaged wheelchair, for example one with flat tyres, should not be used as a seat in a vehicle
- Assist the passenger to board the vehicle, using the passenger lift or ramp in accordance with the manufacturer's instructions
- Assist the passenger to manoeuvre the wheelchair into position inside the vehicle
- The wheelchair user should normally be secured in a forward-facing position and never travel facing sideways
- When there is more than one wheelchair user to be transported, make sure that the wheelchair spaces are occupied in the most suitable sequence
- Ensure there is sufficient space around the wheelchair user
- Ensure the wheelchair is correctly positioned over the tracking
- Where you are using metal ratchet clamps to secure a manual wheelchair: ensure that the wheelchair's front castor wheels are swept forward before fitting the clamps
- Ensure the brakes are applied. This gives a better ride for the passenger under normal driving conditions
- Remove and stow safely any luggage hung on the wheelchair. Luggage is often hung on the backs of wheelchairs. This raises the centre of gravity of a wheelchair and makes it less stable. Also, in a crash, there

would be a risk of the bag swinging over the wheelchair user's head and causing injury, or the contents coming loose and hitting someone

- Fit the wheelchair tie-down equipment according to the manufacturer's instructions. The vehicle should carry a set of manufacturer's instructions for any wheelchair tie-down equipment and passenger safety belts and harnesses used on board. Some organisations use 'wheelchair passports' that show which type of wheelchair tie-down you should use with that particular wheelchair



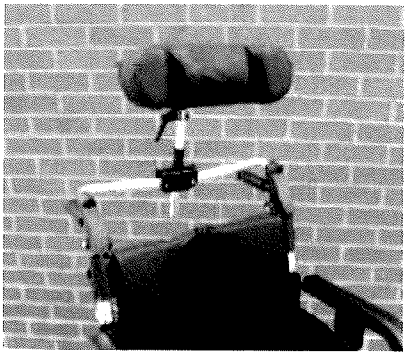
Fit the wheelchair tie-down equipment according to the manufacturer's instructions

Sometimes the attachment point is marked

Help the passenger put on an appropriate safety belt

- Help the passenger to put on an appropriate safety belt or harness (passenger restraint) according to the manufacturer's instructions

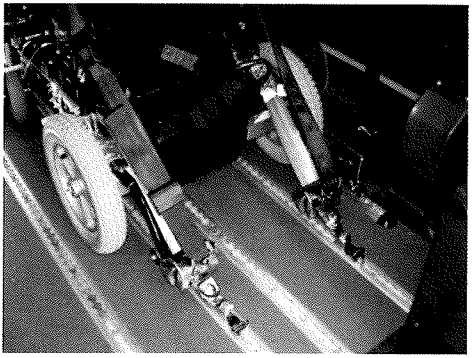
- If possible fit a temporary head restraint to the wheelchair. This will help to reduce whiplash injuries in a crash. Where a temporary detachable head restraint is used, take care to make sure it is fitted securely and positioned correctly. Detachable head restraints are usually fitted with a screw thread; this is designed to tighten when there is a backwards force against it in a crash, keeping the head restraint in place.



A temporary head restraint fitted to a wheelchair

Using wheelchair tie-downs

There are many different types of wheelchair tie-downs made by a number of manufacturers. Some of these are illustrated below. It is not possible to include detailed guidelines on how to use all the types of wheelchair tie-downs that are available.



We have included general guidelines on using four-point webbing wheelchair tie-downs, which are now the generally preferred means of securing wheelchairs in vehicles and fit most designs of wheelchair.

Metal ratchet clamps

A few minibus owners are still using older metal clamps – ratchet clamps or 'wheelchair clamps' – fitted in pairs. However, MiDAS strongly recommends the use of alternative wheelchair tie-downs (such as four point webbing systems) for the following reasons:

- Ratchet clamps are only compatible with a small proportion of today's wheelchairs. They should not be used with powered wheelchairs, narrow manual wheelchairs, heavier wheelchairs (clamps have low weight limits) and those that have sloping or tilting frames.
- It is easier to make mistakes when fitting ratchet clamps – and this will put the wheelchair user's safety at risk.
- Even when correctly fitted, in a crash two ratchet clamps will allow the wheelchair to move much more than a four-point webbing system, and this will worsen the passenger's injuries.

MiDAS therefore strongly recommends that:

- Other, safer types of tie-downs should be used instead of ratchet clamps.
- Where an organisation chooses to continue using ratchet clamps, these should never be the only type of tie-down system in the vehicle. Other equipment, such as four-point webbing tie-downs, should be available for use with the wheelchairs that ratchet clamps are unsuitable for.

The number of different designs of wheelchair tie-down systems is gradually increasing as designs evolve and new models are introduced.
Consequently, there is only one rule you should follow: you should obtain and read the manufacturers' instructions relating to the specific tie-down systems you will be using on your vehicle. There should be a copy of these instructions on the vehicle you are using. You must follow these instructions and not rely solely on someone else showing you how to use this equipment, as they may pass on bad practice.

Wheelchairs are not rigid structures so, in an accident, they flex. Tie-downs must always be attached to the main framework and not to footrests, rear tipping levers, wheels (front or rear) or armrests.

Webbing restraints or 'four-point webbing tie-downs'

Webbing tie-downs are suitable for most types of wheelchair and are particularly relevant to powered wheelchairs and non-standard manual wheelchairs, including many of those designed for children. Most wheelchairs can be secured using four-point tie-down systems within a 1300mm x 750 mm (approx 4 feet 3 inches x 2 feet 6 inches) wheelchair space.

When using four-point webbing tie-down systems you should:

- Attach two webbing restraints to the front, and two to the rear of the wheelchair frame.
- Attach them to strong parts of the wheelchair frame, but higher up on the frame than if you were attaching ratchet clamps. You may find that attachment points are labelled on the wheelchair by its manufacturer.
- Attach the front webbing restraints so as to avoid the footrests. Generally this means the restraints should be fixed into the tracking such that they are acting in a downwards and outwards direction. This also improves the stability of the wheelchair.

Webbing tie-downs used with a powered wheelchair

- Rear webbing restraints should beattached so that they are angled down to the tracking behind the wheelchair.

- This is general advice. You should always follow the manufacturer's instructions for the specific equipment you are using.

Some types of webbing tighteners can fly open under tension, so take care of your fingers when undoing them. Gloves may help.

Powered wheelchairs and mobility scooters

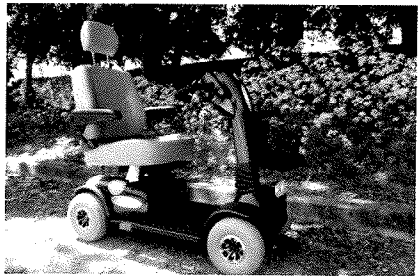
The mobility and independence brought about by powered wheelchairs and mobility scooters (sometimes known as pavement vehicles) means that they are becoming increasingly popular. Unfortunately not all types can be transported safely in vehicles.

Some powered wheelchairs are so large that they would block the gangways, while others may be difficult to restrain correctly. They may be over the weight limits for your usual tie-downs or may need a special type of tie-down because of their design. If you have difficulty in securing a wheelchair of this type, then you will have to explain to the passenger that their wheelchair cannot be transported and inform your manager or organisation.

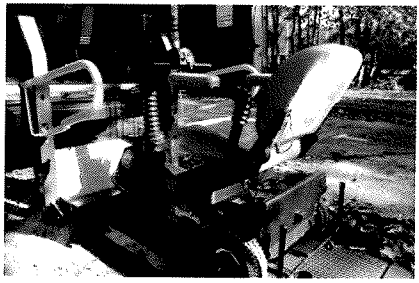
Similarly, it can also be difficult to transport mobility scooters safely. MiDAS strongly recommends that a scooter is not transported in a vehicle unless a risk assessment has been undertaken to determine the safest way for the user to travel. Some organisations have decided not to transport scooters in their vehicles because of safety concerns.

Scooters present higher risks than powered wheelchairs because generally they are:

- bigger – they take up more space on the lift or ramp and inside the vehicle
- heavier – they may be too heavy for the passenger lift
- more powerful – they could more easily overcome the lift backstop.



Scooters come in many shapes and sizes, three and four wheeled



A risk assessment is needed to decide whether a scooter can be transported safely

Use the correct type of scooter restraint and make sure there is a gangway to the emergency exits

The risk assessment should take into account issues such as:

- How the scooter user boards and alights from the vehicle. Note that on a passenger lift there is a risk of falls from a height when the scooter is moved between the lift platform and the vehicle. Following a fatal accident in 2005, the Health and Safety Executive, recognising the danger of the user reversing out of a vehicle onto a raised platform, made a local recommendation that the passenger and their scooter should not travel together on the lift. This is to avoid the scooter user overshooting the lift platform, overcoming the lift backstop and falling to the ground, with potentially fatal consequences. It is not a legal requirement for the passenger to dismount from the scooter and board and alight from the vehicle independently, nor is it incorporated in any formal national guidance, but it should be taken into account when a risk assessment is done.

- The 'driving skills' of the scooter user. This is important if the passenger will be manoeuvring their scooter up and down a passenger ramp. The stability of the scooter on a ramp is also important – the risk of taller, narrower scooters toppling over on a steep ramp should be taken into account.
- How will the scooter be secured in the vehicle? You must only use tie-downs that are specifically approved for use with scooters and are appropriate for the make/model of scooter.
- Is there room to secure the scooter, without blocking in other passengers or blocking access to any of the doors? It is important that in an emergency all passengers can still get access to the doors if there is a need to evacuate the vehicle.
- How will the passenger travel in the vehicle? They must not ride on the scooter. They must use an ordinary seat in the vehicle, and a seat belt.

Question

Is it essential that the passenger and their scooter do not travel together on the lift?

Answer

It is not law but as it was a recommendation from the Health and Safety Executive it should be taken into account when a risk assessment is done. Just as with powered wheelchairs it is essential that you **NEVER:**

- leave a scooter's power switched on when it is on a passenger lift
- allow a scooter user to reverse out of the vehicle onto the lift platform.

Both practices are dangerous and could result in serious or fatal injuries.

Checking and maintenance of tie-down equipment

Wheelchair tie-downs and safety belts, like other equipment, need looking after. Make sure that the equipment available in the vehicle has no obvious signs of damage and is in good working order.

Report any defects with the tie-down equipment and safety belts on the vehicle. When you use webbing restraints and safety belts, keep a look out for fraying of the webbing every time you use them. Make sure that any defective equipment is removed from use and clearly marked so that no-one else accidentally uses it. You should also report any other problems or concerns you may have.

Make an extra effort to keep webbing clean and untwisted, otherwise it can be damaged and its strength will be reduced. If the webbing is soiled and needs cleaning, read the manufacturer's instructions as these may specify the type of cleaning agent you must use.

Storage of equipment

Wheelchair tie-down equipment should be removed from the tracking and stored in a safe place when not in use. Otherwise people may trip over it or it may fly around the vehicle (and become 'missiles') in a crash.

If a wheelchair user transfers to a seat in the vehicle, their folded wheelchair should be properly secured in the vehicle using suitable restraining straps.

Space around wheelchair users

You should allow **sufficient space around the wheelchair and user** so that they do not make contact with other passengers, unpadded parts of the vehicle, wheelchair accessories or wheelchair restraint and safety belt anchor points. This is because in a crash the wheelchair user's arms legs and head will be violently thrown forward and will then 'whiplash' back – if there are solid objects too close by then the injuries will be much more severe.

You should follow this advice when securing wheelchair users in vehicles. It will help to reduce injuries if there is a crash. It was recommended by the MHRA, the government agency that oversees wheelchair safety. If you have any difficulties putting this advice into practice, you should report your concerns to your manager.

passenger safety belts or harnesses that are suitable.

Safety belts and harnesses should be easy to fit and adjust. They should be quick and easy to remove in an emergency. A lap belt is the absolute minimum for forward-facing travel. However, an additional single diagonal strap or double shoulder straps to secure the upper body will prevent face or head injuries should the passenger's body 'jack-knife' forward in a crash and so this is strongly recommended by MiDAS.

Passenger safety belts must fit the passenger correctly and comfortably – so always follow the manufacturer's instructions.

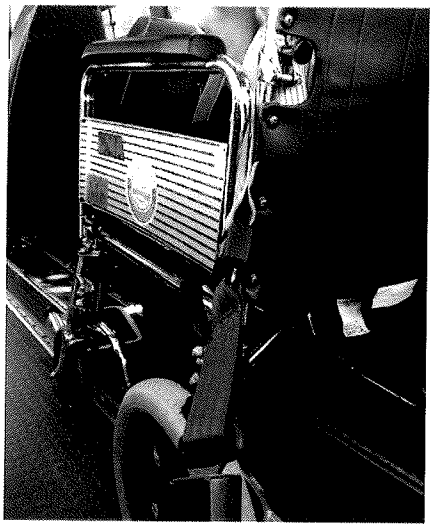
Here we give some general advice for 'lap and diagonal' passenger safety belts (see the photos on the next page):
Lap belt:

- Make sure this goes inside, not outside, the wheelchair's frame
- Keep it low – across the passenger's pelvis. You may need to ask them to help to get the belt into the right position. Lap belts must not ride up onto the stomach because if there were a crash, the belt would either cut into the stomach and cause severe internal injuries or the passenger could slide out from under the belt. So always make sure that the lap belt is as close to the pelvis as possible.

Shoulder (diagonal belt):

- This should fit comfortably across the strong collar bone, mid-way across the shoulder, not across the throat or neck. The neck is vulnerable and a badly positioned belt could lead to serious injuries in a crash.

Sometimes padded sleeves or other accessories are used to make safety belts more comfortable for passengers. Generally, you should only use these where a risk assessment has recommended that they should be used.



The lap belt must go inside the wheelchair's frame

Make sure that the lap belt is as close to the pelvis as possible. It should not ride up onto the stomach. The shoulder belt should fit midway across the shoulder. It should not be below the shoulder nor be across the throat or neck.

Increasingly, accessible minibuses and MPVs are being made with a line of tracking just above the window level ('cant rail tracking'), to provide an upper mounting for the shoulder or diagonal part of the safety belt. This upper mounting means that the safety belt is more effective in restraining a wheelchair user in a crash.

Cant rail tracking provides an upper mounting for the shoulder or diagonal part of the safety belt

Recent research

The Transport Research Laboratory (TRL), working for the government, has carried out research into the safety of wheelchair users travelling in road vehicles. In 2008 TRL looked specifically at the safety of children travelling in wheelchairs. Their conclusions are relevant to the transport of all wheelchair users.

After extensive crash testing of different wheelchairs and safety equipment, TRL concluded that to provide the safest possible journeys for wheelchair users:

- Passenger safety belts must be adjusted correctly so that they pass across the strong parts of the passenger's bone structure – the shoulder, chest and pelvis (see illustrations on the previous page) – follow the manufacturer's instructions. This will reduce the passenger's injuries in a crash.
- Allow enough space in the vehicle so that in a crash the risk of contact injury to the passenger's head is reduced. This is already part of MiDAS guidance.
- Three point passenger safety belts are most effective when the mounting for the diagonal belt is above the passenger's shoulder height. In crash tests, a higher level mounting for the diagonal belt was much more effective in reducing the forward movement of the body – the injuries from a crash would be much less severe.