

Recommended Specification Requirements for Vehicle Modification as Wheelchair Accessible Private Cars or Taxis for Passengers with Mobility Disability

The following requirements are recommended for a wheelchair being used as a passenger seat inside a Private Car or Taxi. The design and construction of the wheelchair shall conform to GB/T 18029.19 or ISO 7176-19 or equivalent standards in order to match with the recommended wheelchair and occupant restraining system. A head and back restraint meeting GB 15083-2019 or ECE R17 is recommended if such system is provided to protect the head and neck of the occupant.

Applicant is requested to provide justifications and relevant supporting document that can prove that alternative standards with equivalent or more stringent safety requirements complying with the standards and regulations as per this guideline on any deviations from requirements as stipulated in this guideline for consideration.

1. Vehicle Construction

1.1 Low-floor Vehicles

The vehicle shall preferably be of low floor type to provide easy vehicle access and wheelchair boarding and alighting. It is recommended that the floor of wheelchair and occupant entrance point shall be at a level not higher than 450 mm above ground. Some vehicles can be equipped with a body height adjustment or kneeling device which shall facilitate lower entrance height.

1.2 Strength of Body, boarding devices and Certification

The body shell and structure of the vehicle floor, and that portion of the vehicle to which the boarding devices are to be attached shall be robust and rigid enough to withstand the expected stresses during operation of the boarding devices and vehicle traveling at all rated loads without noticeable deformation. Any alteration to the body shell and structure shall have to be tested by the recognized testing/certifying laboratory together with testing reports to ensure it is comply with the safety requirements.

1.3 Weight

The gross vehicle weight (GVW) including the weight of the boarding devices, the driver and permitted number of passengers and, their personal effects and the wheelchair, shall not exceed the maximum allocated weight at all times as stipulated in Part I of the Second Schedule of the Road Traffic (Construction and Maintenance of Vehicles) Regulations, Cap. 374A and the Maximum Designed Laden Weight of the vehicle, whichever is lower. It is recommended that the reference weight of the person with disabilities and his/her wheelchair shall be no less than the concerned rated load as stipulated in [“Code of Practice on the Design and Construction of Lifts and Escalators”](#) issued by Electrical and Mechanical Services Department.

2. Wheelchair Boarding Devices

The boarding devices shall be **certified** annually by an independent and qualified surveyor on the safety of design, construction and required rated loads.

2.1 Wheelchair Lift (power-operated)

If an electric wheelchair lift is fitted as a wheelchair boarding device, the wheelchair lift shall be of under-floor or tail lift type. The minimum safe working load (lifting capacity) and area/dimensions of the lift shall be no less than the concerned rated load and area/dimensions as stipulated in [“Code of Practice on the Design and Construction of Lifts and Escalators”](#) issued by Electrical and Mechanical Services Department, and the minimum lift floor area shall be enough to accommodate the wheelchair available in the market. Moreover, the entrance clear height of the vehicle for the wheelchair shall be sufficient for user to safely enter. The edges of the lift shall be rounded to 2.5 mm or more, and corners 5 mm or more. The lift platform shall be covered with anti-slip material. 50 mm bright yellow stripes shall be applied on the sides and perimeter of the upper surface of the lift. A device preventing the wheelchair from rolling off the sides shall automatically come into operation with the platform. When the lift is in the fully stowed / retracted position, no part of the lift system shall protrude beyond the vehicle body.

The lift shall be operated at low voltage of 12 or 24 V, controlled by a switch that would return to off position if released, and be operable only when the vehicle is stationary. A buzzer and yellow flashing lights visible to the rear traffic shall operate with the lift. An overload system shall be incorporated to stop the operation in the event of overload or blockage of moving parts. An emergency stop switch shall be provided and clearly marked on the outside of the vehicle adjacent to the lift operating area. Manual hand pump shall be equipped as a standby facility. When using a wheelchair lift, it should not have any impact on vehicle stability. If the total weight of the vehicle exceeds the GVW mentioned in paragraph 1.3 due to the additional weight of the wheelchair lift, consideration may be given to reducing the maximum number of passengers allowed in the vehicle to free up the available load-bearing capacity of the vehicle.

2.2 Wheelchair Ramp (manual or power-operated)

If a mechanical ramp is provided in place of a power lift, it can be manual or 12-24 V electric power operated. The structural design of the ramp shall be robust, rigid and spacious enough to provide safe access of wheelchair. It shall be secured to the vehicle when it is in use, and able to withstand the loaded weight of the wheelchair and occupant during operation without excessive deformation and vibration. It shall be covered with anti-slip material, and fitted with devices that will prevent the wheelchair rolling over the sides or fall back under gravity. The edges of the ramp shall be rounded to 2.5 mm or more, and corners 5 mm or more. Bright yellow stripes 50 mm width shall be applied on the sides and perimeter of the upper surface of the ramp. Maximum gradient of the ramp shall not exceed 14 degrees or 24%.

2.3 Marking

Clear marking showing the safe working load of the wheelchair lift or ramp shall be displayed conspicuously on the equipment surface or adjacent to the board devices' control unit

3. Wheelchair Accommodation

For each wheelchair, there shall be a fixed and sufficient accommodation area/space to accommodate the wheelchair and its occupant all through the journey when the vehicle is moving. This floor area shall be as level as possible and shall be no steeper than 4 degree to the rear or 0 degree to the front, covered with anti-slip material and marked with 50mm band of bright yellow depicting the perimeter. No other hard object is allowed in this space except the seat back of a seat in the front which shall be covered with soft pads. Hard objects in the surrounding area shall be covered with soft pads as far as practicable. Side facing seating position is not acceptable.

4. Wheelchair Tie-down and Occupant Restraint Systems (WTORS)

A WTORS consists separately of a wheelchair tie-down system and a wheelchair occupant body restraint system working together.

4.1 Wheelchair tie-down System

A wheelchair tie-down system is required to hold the wheelchair in the accommodation area in vehicle deceleration or frontal collision. This system shall therefore function as seat anchors when the wheelchair is being used as a seat on a vehicle. There are various designs of tie-down system to suit different wheelchairs, e.g. 4-point tie down, clamping, and docking.

Under r5(1) of Road Traffic (Construction and Maintenance of Vehicles) Regulations, Cap. 374A –

Every vehicle including all body work and fittings shall be-

- (a) soundly and properly constructed of suitable materials;
- (b) in good and serviceable condition; and
- (c) of such design and method of construction as to be capable of withstanding the loads and stresses likely to be encountered in operation.

4.2 Wheelchair Occupant Restraint System

Under Road Traffic (Safety Equipment) Regulations, in a Private Car or Taxi, a passenger seat shall be provided with an approved seat belt and approved anchorage

points for protection of the passenger. As such, when a wheelchair is being used as a passenger seat in a Private Car or Taxi,

The seat belt and its anchorage points shall comply with the following standards:

- (i) GB/Z 43468 or ISO 10542 or equivalent, and
- (ii) Road Traffic (Safety Equipment) Regulations, Cap 374F.

4.3 Certification

The compliance of the after factory built WTORS with the above-mentioned standards shall be certified in writing by the vehicle manufacturer or a recognized testing authority such as TÜV of Germany, Vehicle Certification Agency (VCA) of the U.K., or other agencies approved by the Commissioner for Transport.

**Vehicle Safety and Standards Division
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