



# Choosing a powered wheelchair

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DLF Factsheet

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# Contents

## Choosing a powered wheelchair

INTRODUCTION	4
SOURCES OF SUPPLY - WHO CAN HELP?	5
CLASS 2 AND CLASS 3 POWERED WHEELCHAIRS	9
PRELIMINARY CONSIDERATIONS	11
TRY BEFORE YOU BUY	11
WHAT DOES THE USER NEED?	13
WHEELCHAIR FEATURES TO CONSIDER	17
WHEELCHAIR CONTROLS	20
NEGOTIATING KERBS	22
BATTERIES AND CHARGERS	24
POWERED WHEELCHAIRS WITH SPECIAL FEATURES	26
WHEELCHAIR ACCESSORIES	28
INSURANCE	28
USEFUL PUBLICATIONS	28
USEFUL ADDRESSES	29

## INTRODUCTION

The wide range of battery-powered vehicles currently available for the disability market is divided into three main categories: powered wheelchairs, scooters and buggies. The advice in this factsheet covers powered wheelchairs only. For advice on scooters and buggies refer to DLF fact sheet 'Choosing a scooter or buggy'.

People tend to think about purchasing a powered wheelchair when they can no longer manage their standard manual wheelchair. First, however, it may be worth considering the range of active user wheelchairs that are available. These are manual wheelchairs that are lightweight and have large propelling wheels on an adjustable axle, so that the position of the wheelchair user within the chair can be adjusted to optimise their propelling and manoeuvring potential. A wheelchair user who may, previously, have found propelling a standard wheelchair too difficult may find that the reduced effort needed to propel an active user wheelchair is sufficient to regain independent mobility. The relative lightness of these wheelchairs, especially over powered wheelchairs, is an advantage if the chair has to be lifted and transported in and out of a car boot. For further details on active user wheelchairs refer to DLF factsheet 'Choosing an active user wheelchair'.

Highway regulations group powered vehicles into two categories: Class 2 and Class 3 vehicles:

- Class 2 vehicles can travel up to 6.4kph

(4mph) and are allowed on pavements and to cross over roads only;

- Class 3 vehicles can travel up to 12.8 kph (8mph) and can be used on roads, and on pavements at the reduced speed of 6.4kph;
- In addition, there is a further smaller group of vehicles designed for off road use that are not governed by highway regulations and can therefore travel at a faster speed.

Within each category a range of different models of vehicle and accessories, each with their own features, may meet individual needs.

For up-to-date product and supplier information, contact the DLF equipment helpline which is open Monday to Friday from 10am to 4pm, tel: 0845 130 9177 (calls charged at local rate) or if you use a textphone: 020 7432 8009.

Alternatively, write to our letter enquiry service or contact us via e-mail at [advice@dlf.org.uk](mailto:advice@dlf.org.uk). To help us give you a concise and informative reply, please provide us with as much detail as possible including information on the difficulties you are having and any solutions you have considered, including equipment ideas.

## SOURCES OF SUPPLY - WHO CAN HELP?

Powered wheelchairs and accessories are provided through a number of different channels depending upon their primary

purpose and whether they are for permanent or temporary use.

## **PERMANENT LOAN**

### **Health provision**

The NHS Wheelchair Service is responsible for assessing and providing wheelchairs to UK residents who have permanent difficulties with walking. Centres throughout the country oversee statutory wheelchair provision within a health authority or primary care trust.

Manual wheelchairs are the most common wheelchairs provided but, in addition, local wheelchair service centres can provide:

- an indoor powered wheelchair (EPIC) if the wheelchair user is unable to manually propel him/herself indoors;
- an attendant controlled powered wheelchair if the carer has difficulty pushing a manual wheelchair outside;
- an indoor/outdoor powered wheelchair (EPIOC) to severely disabled people who want independent mobility outside;
- specialised seating systems to give postural support within a wheelchair (provided by specialist seating clinics that are part of the NHS Wheelchair Service);
- a wheelchair cushion or a pressure reducing cushion if the wheelchair user is vulnerable to pressure sores.

Wheelchairs provided by the NHS Wheelchair Service remain the property of the service and consequently it is its responsibility to repair and service the wheelchair.

Addresses of local centres can be obtained by calling NHS Direct on 0845 4647.

### **Referral**

Referral to the Wheelchair Service is usually via a healthcare professional such as a therapist, nurse or doctor. Some areas may accept self-referral. The assessment and prescription for the wheelchair itself is usually undertaken by an accredited or recognised therapist.

### **Eligibility criteria**

To obtain an NHS wheelchair, you must have limited walking ability and also meet other local criteria. Each district wheelchair services sets its own eligibility criteria within broad national guidelines. Because of the additional cost of providing a powered wheelchair, the criteria for obtaining one is much more stringent. You must:

- be severely disabled;
- be able to benefit from an improved quality of life that independent outdoor mobility should provide;
- be able to handle the wheelchair safely;

- meet any other criteria that your local wheelchair centre has set.

## **Education service**

The education service of the local council may provide equipment needed during education in school or at college. This includes access devices such as ramps, adaptations to school premises, powered wheelchairs for mobility at school, as well as other writing, speech and computer equipment. In theory, the equipment should be used for educational purposes only. To make procurement of specialised equipment easier, it may be necessary to refer to the equipment needs of the child in their Statement of Educational Need.

## **Employment via Jobcentre Plus**

The government run Access to Work scheme is designed to help people overcome obstacles to employment caused by their disability. Local job centres employ disability employment advisers (DEAs) who work as part of the Disability Services Team (DST). They provide a wide range of advice and help to people who have particular difficulties in finding or keeping work because of their disability. The role of the DEA includes helping to identify equipment or adaptations that can assist an employee with the tasks required of him/her for their continued and effective employment; for example, they may be able to provide a wheelchair to an employee with walking difficulties.

The level of financial assistance given towards adaptations and equipment depends on what is required, but for an employee who has been in his/her job for more than six weeks, 80% of approved costs above a threshold of £300 and up to £10,000, and all costs over £10,000.

Referral to the DSTs is open - to the person with a disability, employer, or healthcare professional. For further information, contact your local Jobcentre Plus.

## **SHORT TERM LOAN/HIRE**

### **Private hire**

A number of private hire firms make daily/weekly/monthly hire charges, which may vary in amount and in the conditions attached. Before you choose to hire, consider the following:

- Does the company provide a delivery and/or collection service and, if so, are there any additional charges?
- Does the company ask for a returnable deposit?
- If hiring long term, is the vehicle subject to a six monthly service liability and, if so, will a replacement wheelchair be supplied in the mean time?
- Who is responsible for maintenance if you have a puncture, for example?

- If you are hiring for holiday use, are you permitted to take the vehicle overseas? Are there additional charges, and/or an increase in the deposit needed?
- Are you obliged to take out insurance? Is this included in the price, and what does the insurance cover?
- When hiring a wheelchair, make sure you understand how to operate it and feel confident using it, and that you receive instructions on how to charge the batteries and carry out other simple maintenance.

## Shopmobility

Many towns and cities have Shopmobility Schemes through which people can loan manual wheelchairs, powered wheelchairs, and scooters to enable them to go shopping. Some of the schemes are free but some require a returnable deposit. For details of your nearest Shopmobility office contact the National Federation of Shopmobility (see useful addresses).

## PURCHASE OF EQUIPMENT

### Private purchase

Private purchase might be necessary if the user does not meet the NHS Wheelchair Services eligibility criteria; or he/she may prefer the wider choice offered by the private market.

The purchaser has the option of:

- using the Motability Scheme;
- personally funding the cost of a powered wheelchair;
- applying to charities/benevolent funds etc for funding;
- buying second-hand.

## Motability Route2Mobility Scheme

This is a non-commercial finance scheme open to people who receive the higher rate mobility component of the Disability Living Allowance (DLA) - which people can only apply for before their 65th birthday; or War Pensioners Mobility Supplement. Vehicles are supplied through a network of accredited suppliers and can be purchased using a one, two or three year hire purchase agreement. Clients must agree to surrender part or all of their weekly DLA instalments to Motability for a fixed term. No deposit is required unless the cost of the wheelchair is over £6,000.

Further information on how the scheme is managed, information on the range of wheelchairs available through the scheme and an application form are available from Route2Mobility Ltd (see useful addresses).

## Private funding

People who do not receive the higher rate mobility component of the DLA may need to use their own funds to pay for their wheelchair; or they may choose to arrange a loan through their bank or building society privately. The wheelchair suppliers may offer their own finance scheme, but do check terms and conditions and compare the interest rate of any loan you intend to take out with the rate offered by other loan providers.

## Funding from charitable Sources

If you have little or no disposable income, or you do not have the financial capacity to support a private loan you could consider applying to a charity, benevolent or occupational fund for financial assistance. The following information sources can help you to identify specific organisations that may be able to help you:

\* *A guide to grants for individuals in need* published by the Directory of Social Change (see useful addresses). A social worker, Citizen's Advice Bureau or local library may have a copy of this book that you can refer to;

\* The Association of Charity Officers (see useful addresses) has a list of members who can provide funding for equipment.

## Second-hand equipment

Buying second-hand can be a cheaper way of finding a solution to your mobility

difficulties but, since choice is more limited, you must make sure that you do not compromise on your essential requirements. Also check that what you are buying is in good working order. You do have certain consumer rights when buying second-hand; for example, the seller must accurately describe the product he/she is selling; and you should be made fully aware of any faults that need attention. If possible, obtain a written description of the product from the seller before you buy so that, should you find any faults, you can get your money back more easily.

There are two sources of second-hand equipment: mobility equipment retailers and private individuals.

### Buying from a mobility equipment retailer

Some commercial suppliers of wheelchairs also buy unwanted vehicles, recondition them, and then offer them for sale with a short guarantee of, for example, three months. Buying second-hand from a retailer is generally more expensive than buying from a private individual, but the wheelchair is likely to have been serviced and should be in reasonable working order.

### Buying from a private individual

Some mainstream magazines and several disability organisations publish journals that contain advertisements for second-hand equipment. If you are buying

second-hand from a private individual, you must make sure that the powered wheelchair has been regularly maintained; that you also receive accompanying literature, for example a care manual; and that you receive instructions on how to control and steer the wheelchair. You will also need to find the local company able to service your wheelchair and carry out future repairs. The DLF factsheet 'Sources of second hand equipment' lists advertising sources.

## **CLASS 2 AND CLASS 3 POWERED WHEELCHAIRS**

Powered wheelchairs are divided into two main categories: Class 2 for pavement use; and Class 3 for pavement and road use.

### **CLASS 2 POWERED WHEELCHAIRS**

Class 2 powered wheelchairs can travel up to 6.4kph (4mph) on pavements and on the road only to cross from one side of the road to the other. They can be divided into sub-sections:

#### **Indoor use only**

- for indoor use;
- small turning circle;
- could be used on a level patio area or in a small, level garden;
- short distance range.

#### **Indoor and outdoor use**

- for indoor use;
- for outdoor use over standard terrain;
- over low kerbs;
- short/medium distance range.

#### **Outdoor use only**

- limited indoor use;
- outdoor use including uneven ground;
- kerb climbing up to 10cm;
- medium to long distance range.

The wheelchairs that can be used both indoors and outdoors tend to be the most popular types because of their versatility. Wheelchairs usually have to be taken indoors for storage and maintenance so the overall size and manoeuvrability of an indoor/outdoor wheelchair suits most people.

### **CLASS 3 POWERED WHEELCHAIRS**

These tend to be larger than Class 2 vehicles and can be used on the roads where they can travel up to 12.8kph (8mph).

Owners of class 3 vehicles do not have to hold a current driving licence. Drivers should be disabled and aged 14 or over,

and they must be familiar with the Highway Code and drive in accordance with these rules at all times. This includes complying with relevant eyesight requirements and not driving under the influence of alcohol. Class 3 vehicles are not allowed on motorways, cycle lanes or bus lanes. Although legally allowed on dual carriageways, the size and relative slow speed of a Class 3 wheelchair can be hazardous to larger, faster moving traffic, and the wheelchair driver may feel extremely vulnerable.

It may be possible to enrol on a training course and receive instruction on how to drive your wheelchair safely on the highway. Your local road safety officer or Mobility Centre (see useful addresses) may know of courses running in your area.

Standard features of class 3 wheelchairs are:

- four wheels fitted with chunkier tyres;
- kerb climbing 10cm or more;
- long distance range;
- two-speed settings: slow (6.4kph) for pavement use, and fast (12.8kph) for road use, usually changed by the flick of a switch;
- lights, indicators, horn, rear-view mirror and rear reflectors (all required by law).

In addition, if the vehicle is to be used on a dual carriageway it must be fitted with a flashing beacon that can be used optionally

when driving on all roads to make other road users more aware of the presence of a wheelchair.

## **PRELIMINARY CONSIDERATIONS**

Before you proceed, you must be clear in your mind what you want the wheelchair for. If you need it to improve your indoor mobility, you must have level or ramped access into your home. Doorways must be wide enough to accommodate the wheelchair width and there must be enough space within rooms to enable you to turn your wheelchair around. It may be necessary to do some uncluttering of your home environment to ensure routes through your home are unimpeded. You will need to compare the size and turning circle of the wheelchairs you are looking at.

If you are intending to use the wheelchair outside, bear in mind that handling the wheelchair over uneven ground, passing pedestrians and crossing roads, requires a fair amount of confidence. You must look at the distance you intend to travel and the routes you will be taking to get an idea of what you will be requiring your wheelchair to do.

In addition to the ability to handle the controls you must also:

- be able to judge distances and widths (to manoeuvre the wheelchair safely between doorways and through busy streets);

- have reasonable eyesight;
- be aware of your responsibilities as a wheelchair user.

People with visual, perceptual or intellectual difficulties and who want to control a wheelchair independently should seek medical advice and have a thorough assessment at a Mobility Centre. For details of your nearest Mobility Centre contact the Forum of Mobility Centres

(see useful addresses).

You will need a secure and waterproof place in which to store your powered wheelchair, close to a power point to charge its batteries. If you are keeping your vehicle in your home, make sure access is possible. It may be necessary for you to install an access ramp leading into your home. Once indoors, make sure the vehicle is not going to obstruct essential circulation space. If you live in a block of flats and plan to keep your wheelchair in a shared hallway, ask permission of other residents and your landlord, and inform the local fire officer to ensure that the wheelchair will not cause a hazard in a fire emergency.

## **TRY BEFORE YOU BUY**

Powered wheelchairs are expensive so it is essential that you do not rush into buying a vehicle that you later find is not entirely suitable.

Before buying, aim to try out and compare a range of different powered wheelchairs. This can be done at several venues.

## **DISABLED LIVING CENTRES**

You may have a Disabled Living Centre (DLC) near you. People can visit these equipment demonstration centres to see and try out ranges of equipment and receive impartial advice to help them choose appropriately. Not all DLCs display wheelchairs; some focus on equipment to help with tasks within the home. You will need to contact your nearest centre to find out if they can help you. Up-to-date addresses are held by Assist UK (see useful addresses), or look on its website at [www.dlcc.org.uk](http://www.dlcc.org.uk).

## **MOBILITY CENTRES**

Some mobility centres (that primarily advise on vehicle adaptations for disabled drivers/passengers) also offer advice on powered wheelchairs. Some have an outdoor area for trying out vehicles over different gradients and terrain, and can assess your needs more formally, usually for a fee. If you are applying to a charity for funding for your wheelchair, you could include the cost of the assessment in your grant application.

Mobility centres may also have a selection of vehicle racks and hoists on display as examples of ways of transferring and transporting your wheelchair.

To find out the address of your nearest Mobility Centre, contact the Forum of Mobility Centres (see useful addresses).

## **NATIONAL EXHIBITIONS**

Disability equipment suppliers attend national exhibitions to demonstrate their equipment to both professionals working in the disability field and to disabled people. Annual events include the Mobility Road show and the Independent Living Exhibition. The DLF advice service can provide information on forthcoming exhibitions, their dates and venues.

## **HOME DEMONSTRATIONS**

Many suppliers of powered wheelchairs provide a home demonstration service, which allows users to try out the vehicle in their home environment. Before you invite a sales representative into your home, you may prefer to buy from a company that belongs to a trade association such as the British Healthcare Trades Association (see useful addresses). The association has established a registration scheme, open to BHTA members and non-members, which lays down a code of conduct and minimum professional standards.

A home visit is always useful, before a final decision to buy is made:

- check that the vehicle can be manoeuvred over thresholds, through doorways and over terrain where you are

likely to be using it.

- make sure you sit in the wheelchair and drive it - do not allow the sales representative alone to take control;
- have a third impartial person with you to give advice and offer another opinion.

Although you hope there will be no need to question the integrity of the sales representative, a minority may try to take advantage of your vulnerability. Take your time over making any decision to buy. Do not buy from anyone exerting pressure on you to buy their product. You must give yourself an opportunity to think things through independently.

Before you commit to buying, check the following:

- What is the delivery time?
- Will the powered wheelchair arrive ready assembled?
- What guarantee is available?
- What after-care service is offered?
- How much is the company's call out charge?
- Will spare parts be brought to the home?
- If the powered wheelchair has to be

taken away for repairs, will a loan vehicle be offered?

- If the same vehicle can be supplied direct from the manufacturer or from other retailers, how do prices compare?

You must be certain that:

- you have the necessary skills to handle a powered wheelchair;
- that the wheelchair is capable of doing what you require of it;
- your home environment can accommodate your wheelchair.

## **WHAT DOES THE USER NEED?**

### **A STABLE SEATING BASE**

Wheelchair users must feel secure and supported within their wheelchair seat so that they can then focus on the task of driving and steering their wheelchair. Correct positioning will also make everyday tasks, such as reading, writing and feeding, easier to achieve. As a general rule, the seat should have a level base and be wide enough to accommodate outdoor clothing if necessary, but not so wide that the user is forced to sit asymmetrically in order to feel supported. If the seat is too narrow, it will be uncomfortable and increase the risk of pressure sores.

If the wheelchair user has poor sitting balance or his/her disability causes postural

asymmetry or variation in muscle tone, a more supportive seat unit with trunk and pelvic supports may be necessary.

### **A VEHICLE THAT IS EASY TO STEER**

The joystick control of standard powered wheelchairs does not require much effort to use, although adjusting to the sensitivity of joystick steering may take a little while to master. As a general rule, better control is achieved by placing the control in the V between the thumb and the index finger, rather than grasping the joystick itself.

The majority of controls are programmable so can be altered to accommodate less refined movements. If using a joystick is impossible, alternative switches are available.

### **A VEHICLE THAT MAKES TRANSFERRING EASY**

You must be able to transfer in and out of your wheelchair safely and, if possible, independently. Features such as flip-up/swing-away footrests, detachable or fold-down armrests and flip-back kerb riders will give you closer access to the wheelchair. Powered wheelchairs can only be moved manually when the motors are disengaged (i.e. the chair is put into free wheel) so, unlike a manual wheelchair, a powered wheelchair cannot be pulled up close to you for transfer. So, make sure there is room around the wheelchair to position yourself near to it. Although a

powered wheelchair should not move during transfers, a parking brake is often provided for added security.

If you can manage a standing transfer, look at the position of the kerb riders. A centrally positioned device can get in the way.

If transferring independently is difficult, a carer should not help to lift you manually as this will put him/her at risk of injury. A range of equipment is available to help with transfers such as sliding boards and rotating discs or, if necessary, use a hoist. For advice on moving and handling issues consult the occupational therapist based in local social services departments. The DLF Advice Service can provide information on the ranges of transfer equipment available.

## **A VEHICLE THAT IS EASY TO MANOEUVRE**

A few wheelchairs are designed primarily for indoor use and tend to be smaller and more manoeuvrable. Check that the chosen powered wheelchair will:

- go through doorways and over thresholds;
- manoeuvre on floor surfaces;
- make tight turns from hallways into living rooms;
- manoeuvre backwards, if necessary, e.g. reversing out of the toilet;

- go down shop aisles etc.

You may find that a powered wheelchair does not adjust immediately to a change in direction because the castors need a split second to swivel round.

Wheelchairs that can move around easily inside tend not to be as efficient outdoors - coping with longer distances, steep or uneven ground. You may have difficulty in finding a wheelchair that meets all your requirements, although newer designs incorporate mid-wheel drive to give a smaller turning circle. You may have to make compromises and/or continue to use a manual wheelchair for some activities.

Vehicles designed purely for outdoor use usually have very wide turning circles and wide/deep treaded tyres for easier movement over rough or soft ground.

## **A STABLE VEHICLE**

Over flat, even ground all powered vehicles are stable. However, a user with a lower limb amputation, especially a high level or double amputation, should choose carefully because the lack of weight at the front may affect the centre of gravity and could cause the vehicle to tip backwards especially when climbing kerbs. Check with the manufacturers about weighting the front end. Stability can also be decreased if your wheelchair backrest is reclined or your wheelchair seat tilts backwards (tilt-in-space).

## **FREEDOM OF TRAVEL**

Powered vehicles allow the user to travel quite long distances without too much personal effort. Although many vehicles have a good distance/range per battery charge - some even travelling up to 30 to 40km (25 miles) - to cover these distances more travelling time is required. Powered vehicles are not replacements for cars. It could take a minimum of four hours to cover 25km (16 miles) in a pavement-only vehicle.

## **A VEHICLE THAT IS EASY TO TRANSPORT**

Although most manufacturers claim that their powered wheelchairs can be dismantled and folded for transporting, it is not something that can be done easily and should only be undertaken in emergencies or occasionally (e.g. when travelling on holiday). Bear in mind that if you transport the wheelchair somewhere and then bring it back again, this will involve lifting the components at least four times, assembling and disassembling them. It is not a task that can usually be undertaken by wheelchair users themselves because it requires flexibility (to reach catches and , plugs, for example); strength (to lift the component parts); and standing/walking stability.

Most powered wheelchairs have a folding frame that can be folded once the batteries have been removed. Wheelchairs tend to have two 12 volt batteries each weighing approximately 10kg. A few wheelchairs can also have detachable motors. The frame itself will not fold down as compactly as the

frame of a manual wheelchair and will be heavier to lift. The wheelchair supplier will be able to tell you how much each component part weighs; the heaviest component can be from about 12kg to 35kg. Remember that a bag of sugar weighs only 1kg.

If you do need to transport your wheelchair on a regular basis a few solutions will avoid the need to lift it. If you have an estate car, and the backrest of your wheelchair folds down, an assistant may be able to drive the wheelchair, unoccupied, into the back of the car via ramps. Also wheelchair hoists can be fitted to the back of a car to lift component parts or the whole vehicle into a car; or a wheelchair can be transported on a rack or trailer. Methods of transporting a wheelchair are discussed in the DLF factsheet 'Out and about with your wheelchair'.

## **A VEHICLE THAT MEETS THE ASSISTANT'S NEEDS**

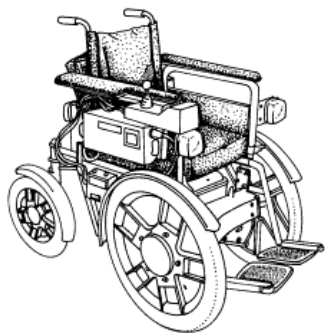
Powered wheelchairs with dual or attendant control enable someone else to control the wheelchair from the back. Controls are sited on the right or left pushing handle of the wheelchair to suit the requirements of the assistant. Dual controls not only enable users to be independent when they want to be, but also make it possible for someone else to help when the need arises.

The comfort and mobility needs of the wheelchair occupant are of paramount importance, but if the assistant has to undertake routine maintenance, such as pumping up tyres and putting the wheelchair on charge, and dismantling and assembling the wheelchair then he/she must be involved in the selection process to make sure the tasks required are manageable.

## WHEELCHAIR FEATURES TO CONSIDER

### FRAME

A rigid frame is stronger than a folding frame but may make transporting the wheelchair more difficult. A folding frame generally operates once the wheelchair batteries have been removed.



### WHEELS/TYRES

Wheelchairs with smaller wheels are generally easier to drive in confined spaces; larger wheels are better over uneven ground. Some models have the same size wheels at both front and rear, while others

may have smaller wheels in front and larger rear wheels. A few wheelchairs, primarily designed for outdoor use, have large drive wheels at the front to make outdoor terrain and kerbs easier to negotiate.

The drive wheels are those to which the motor directs its power.

Rear wheel drive provides better grip and power when driving over uneven or slippery ground, especially as the weight of the user is directly over these wheels.

Front wheel drive provides better manoeuvrability.

A recent wheelchair development is a six-wheel base with the drive wheels positioned centrally to give a smaller turning circle.

All powered wheelchairs are fitted with a free-wheel facility to disengage the motors so that the wheelchair can be pushed in an emergency situation. A powered wheelchair is heavy to push and manoeuvre manually.

There are different types of tyres including:

- pneumatic tyres that must be inflated regularly to maintain air pressure and checked for punctures. They give a smoother, more comfortable ride and better traction on kerbs, slopes and rough ground than other types of tyre.

Punctures can be repaired in a similar way to bicycle tyre punctures. If this task is too difficult to manage at home, a local cycle shop or mobility vehicle retailer should be able to carry out the repair;

- solid tyres do not puncture or need inflating and may make it easier to manoeuvre on some surfaces;
- puncture-proof tyres are a compromise between solid and pneumatic tyres. They are made of an open cell rubber compound to help with shock absorption;
- deep tread pneumatic tyres provide increased grip and stability on slopes, muddy grass and rough or uneven ground.

## FOOTRESTS

- Detachable footrests can be completely removed and therefore lessen the weight of the unit if the wheelchair needs to be transported. In some circumstances, it might also provide better access during assisted transfers on and off the wheelchair. However, make sure that the footrests do not become mislaid.
- Swing-away footrests can be swung out of the way to give better access to the wheelchair seat during transfers.
- One-piece footrests provide a greater area of support for feet and may allow the user to move his/her feet around. Some may not be detachable and may interfere with transfers.

- Elevating footrests are available for people who need to have their legs raised, or for those who have stiffness in their knees.
- Height adjustable footrests make it possible to accommodate the leg length of the user. However, footrests that are positioned very low can make contact with the ground when going up hills, over uneven ground or when negotiating kerbs. It may be necessary for someone with long legs to look for footrests that are angled further outwards.
- Angle adjustable footrests are a useful feature for people whose legs tend to kick out in a spasm. The angle of the footplates can be altered to a position that may lessen spasm.
- In addition, wheelchair footplates can generally be hinged upwards; heel loops to help keep the feet on the footplate and a calf strap across the footplate hangers to prevent the legs slipping backwards may be available.

## ARMRESTS

Armrests define the width of the seat, help the user to feel more secure and provide support for the elbows. There is a range of different styles to choose from.

- Full-length armrests run the full length of the seat from back to front and provide more substantial support

particularly when stand up and sitting down. They often include an attachment for a tray. However, they can prevent a close approach to a table.

- Desk-style armrests are shorter in length and allow access to work surface, but do not offer as much arm support and may not be suitable for people who need to push down on the armrest to help them stand up.
- Adjustable height armrests provide maximum support and comfort.
- Detachable armrests reduce the size/weight of wheelchair and can make storage and transportation and sideways transfers on and off the wheelchair seat easier. However, they can be mislaid.
- Fold-up/fold-down/swing-away armrests may be more convenient for someone who needs to transfer sideways.

## **BACKREST**

The height of the backrest is often a matter of personal preference but, as a minimum, it should be high enough to stabilise the lower back. Very low backrests are not common in powered wheelchairs because powered wheelchair users tend to require more adequate support. The backrest height generally reaches shoulder blade level or beyond.

- Folding backrests - reduce the overall size of the wheelchair which makes

storage and transporting easier; and can help when positioning slings for assisted transfers.

- Non-folding backrests provide firmer back support and secure attachment for more supportive backrest systems.
- Semi or fully reclining backrests can either be reclined manually by an assistant and some can be adjusted electrically by the user.

## **SEAT**

It is vital that the user is accurately assessed for the correct seat size and style as this has a direct impact on posture and comfort. Remember to allow room for outdoor clothing if you will be using the wheelchair outside.

A slung seat and backrest are standard features, but some powered wheelchairs can have a more substantial seat unit that is padded and/or contoured to give additional comfort and increase shock absorption. It is not generally advisable to sit on only a slung seat as this will not provide sufficient comfort. As a minimum, the wheelchair seat should be fitted with a foam cushion or a cushion with higher pressure reducing properties if the user is vulnerable to pressure sores. Refer to DLF factsheet 'Choosing Pressure Relief Equipment' for more advice.

Some people may require more support than that provided by a standard wheelchair seat. A range of seating

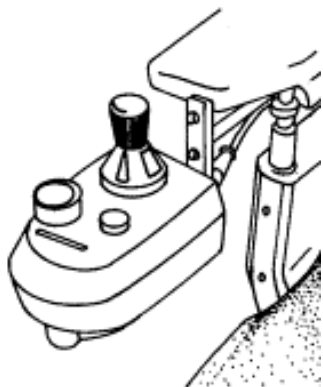
systems is sold separately and usually an occupational therapist or physiotherapist is involved in the selection process to find the most suitable system. The seating system must be compatible with the wheelchair chassis.

## **BRAKES**

All powered wheelchairs have brakes that automatically engage when the user lets go of the joystick or accelerating control.

Some models have the option of a hand brake, which rests on the tyres when stationary (tyre pressures must therefore be kept firm). This provides extra security.

## **WHEELCHAIR CONTROLS**



Wheelchairs are fitted with a control console that will generally include:

- an on/off switch or key;
- a control to drive and steer the

wheelchair (usually a joystick);

- switches or a dial to limit speed;
- a horn;
- switches for lights or indicators;
- a battery level indicator.

On some makes of wheelchair the control console can be dropped down, swung away or temporarily repositioned to improve access to the wheelchair seat during transfers.

## **ON/OFF SWITCH OR KEY**

This immobilises the vehicle when it is not being used. A key can be removed for extra security. The controls must be turned off when the user is transferring in and out of the wheelchair to prevent the wheelchair moving should the joystick be accidentally knocked.

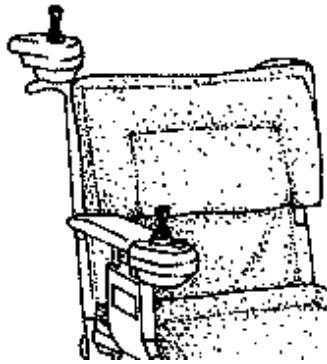
## **JOYSTICK AND ALTERNATIVE CONTROLS**

Most chairs have a proportional joystick control that requires minimal hand movement to control speed and direction.

Light, forward touch progresses the wheelchair slowly; pushing the joystick further will increase speed. Direction is controlled by moving the joystick towards the left or right; or backwards to drive the

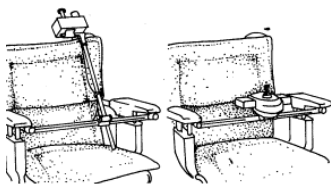
wheelchair in reverse. People who do not have a delicate touch can have a joystick that is not proportional in operation. A slight tremor can usually be accommodated by the electronics of a joystick; a more significant tremor may need a more sophisticated control to compensate for it.

The joystick is usually mounted on the left or right armrest. Some are permanently fitted at the factory, while others can be changed to the other side quite easily.



Many wheelchairs can also have the option of a joystick mounted at the back to enable an assistant to control the wheelchair. This can replace or be in addition to the armrest joystick. If the wheelchair has dual controls, a switch determines whether the wheelchair user or the assistant is driving the wheelchair.

### **Alternative controls**



Many wheelchair manufacturers can supply alternative controls. These may include a tray-mounted joystick; switches mounted so that other parts of the body can be used to control the wheelchair such as the chin, head or foot; touch sensitive switches; a suck/blow switch etc. These alternative switches make it possible for severely disabled people to control their wheelchairs independently. Centrally mounted controls may help to improve body symmetry and help to promote a stable seating posture.

### **SPEED LIMITER**

Most powered wheelchairs have a speed limiter, which determines the maximum speed to which the wheelchair can accelerate to, up to its maximum legal limit (6.4kph on the pavement and 12.8kph on the road). It may be a simple switch to select a slow/fast speed, or a dial to give a wider and more accurate choice of speed.

### **HORN**

A horn is generally available on all wheelchairs that can be used outside, and is a legal requirement on Class 3 vehicles. The horn should be used to warn other pavement/road users that you are there, but the wheelchair user must also show consideration to pedestrians. Although the legal limit for a pavement vehicle is 6.4kph, in a busy pedestrian area it will not

be safe to travel at this speed and it would be unreasonable to expect pedestrians to get out of the way.

## **SWITCHES FOR LIGHTS AND INDICATORS**

Your wheelchair should be fitted with lights if you plan to use it at night and must, by law, have lights and indicators if it is a Class 3 vehicle. Switches and/or buttons for the lights and indicators will be sited on the control console.

## **BATTERY LEVEL INDICATOR**

Not all control consoles are fitted with a battery level indicator and one may not be necessary if the wheelchair is to be used only indoors. If you plan to travel further afield, a battery level indicator will ensure that you know that there is sufficient power in the batteries for your journey and will indicate when charging is required.

## **WHEELCHAIR PERFORMANCE**

If you require a wheelchair for outdoor use, first assess your local environment and think about where you are intending to go in your wheelchair. To get an idea of whether the wheelchair you are looking at is going to be suitable, find out what distance it is capable of achieving on a full charge - the range; and how well it can manage on hills - the gradient. Most brochures will have this information in a technical specification

section, but this should be used as a general guide only. The figures quoted by the manufacturers in their brochures can be achieved under optimum conditions, and with new batteries on a full charge. They can be affected by:

- condition of batteries - older, well used batteries will not store as much power;
- weight of user - the heavier the person the more power will be used;
- terrain to be covered - climbing hills and kerbs uses up more power;
- accessories - lights and indicators are powered by the wheelchair batteries;
- weather - batteries do not perform as well when it is cold.
- if you are heavier than average (i.e. more than 11 stone/70kg), the distance your wheelchair will cover and its performance on gradients will already be reduced without considering the other factors mentioned above;
- the technical specifications will also give details of the maximum speed

Your wheelchair is capable of achieving. This speed can be maintained on level ground and gentle hills but, when climbing a continuous hill, the wheelchair motors may not be able to maintain the same level of thrust as the wheelchair approaches the top of the hill.

## NEGOTIATING KERBS



A wheelchair without kerb climbers may be able to negotiate a small raise of up to 5cm. With the addition of kerb climbing devices, a higher kerb of at least 10cm can be negotiated. Check with suppliers the recommended maximum height for each wheelchair and the technique you should use to climb and descend kerbs safely.

The three main types of kerb climbers are:

- side mounted - a pair of arc-shaped devices fitted to either side of the wheelchair that lift the front wheels of the wheelchair up and onto the kerb. They tend to increase the overall width of the chair. Some styles can be detached (useful for indoor manoeuvrability); some can be flipped back so are less likely to hinder sideways transfers;
- centrally mounted - wheel or arc-shaped devices are situated between the two front wheels. This is less likely to hinder sideways transfers and will not increase

the width of the wheelchair, but may get in the way of standing transfers;

- direct drive - some chairs have wheels large enough to climb kerbs without special devices. These wheelchairs tend to be larger and have a wider turning circle and therefore are not as easy to manoeuvre in confined spaces.

Sometimes, kerb climbers can be bought and attached to the wheelchair as an accessory so, if the user is not sure whether they will be needed, they can be bought at a later date.

## GOING UP KERBS

Most wheelchairs require a head-on approach to climbing kerbs. If regularly used routes involve frequent kerb climbing, these routes should be tried out before the powered wheelchair is bought. Although kerb climbing can be carried out safely, the driver does need to be competent at handling the wheelchair. It does involve some jolting so good sitting balance is essential, and it may prove too uncomfortable for people with painful joints. If dropped kerbs can be found (even if it means taking a slightly longer route) this might be preferable.

The absolute maximum that a wheelchair can negotiate is 13cm, but it must be remembered that this is under ideal circumstances. The following may influence this:

- battery charge level - if the power is low, high kerbs will be more difficult;
- user position - the user may need to move his/her body weight to shift the centre of gravity to assist the manoeuvre;
- state of the kerb and pavement - if the kerb is uneven or the pavement behind it cracked or slippery with sand, gravel or leaves, then kerb climbing will be more difficult;
- footrests - kerb climbing will not be possible if the wheelchair footrests are too low as they will touch the ground;
- anti-tip devices/stabilising wheels - many wheelchairs are fitted with these devices to ensure that the vehicle will not tip backwards or sideways when climbing a high kerb or going down a steep kerb.

## GOING DOWN KERBS

Most wheelchairs are designed to go down backwards so that they are leading with their larger wheels. Once down, the wheelchair then needs to be turned through 180 degrees to cross the road - quite time consuming and risky on busy roads. It may be unsafe for users with neck problems to manoeuvre backwards as they may not be able to see oncoming traffic.

## BATTERIES AND CHARGERS

Battery powered vehicles operate from either one or two, 12 volt rechargeable batteries which are not interchangeable with cheaper car batteries (used only to start a car engine and not to provide continuous power).

New or newly recharged batteries must not be installed with used ones.

Battery output is measured in ampere hours (ah) and, generally, the larger and heavier the batteries the greater the output capacity and range travelled. A choice of battery capacities is often available when purchasing new vehicles or replacement batteries.

The distance travelled or range from a fully charged battery depends on its ampere rating, age, condition, type and temperature, as well as external factors such as the weight of vehicle and user, terrain covered. Batteries in a vehicle stored outdoors at colder temperatures may not maintain their charge as effectively as those stored in a warmer environment.

Remember to include the on-going costs of maintenance and replacement of batteries when budgeting for a powered wheelchair.

## TYPES OF BATTERIES

Two main types of battery are available:

- lead acid/wet batteries require checking and topping up with distilled water. They are less commonly used these days because of the inconvenience of topping up; the risk of corrosive spillages; the requirement to charge them in a ventilated area due to the emission of gases during charging; and their unsuitability for air travel.
- gel batteries are maintenance free and are so called because their conducting chemicals are suspended in a gel-like substance so no topping up is required. However, they do not last as long as wet batteries and are more expensive to replace.

## CHARGING BATTERIES

The following information covers general points to consider regarding the maintenance and charging of batteries. However, it is advisable to follow the guidelines recommended by the manufacturer.

Ideally, the powered wheelchair needs to be placed beside a mains electricity power socket so that the batteries are charged in situ, usually overnight, using a specified battery charger.

Check that the charging point is easily accessible. Charging of wet batteries

should always be done in a well-ventilated room as gases are given off. Although these are not poisonous, they could cause an explosion if ignited by a flame. It is also recommended that batteries are not charged in a room where someone is sleeping.

Remember the following points:

- check wet batteries regularly before charging to make sure that water is covering the cells;
- always use the right charger for the batteries. Dry batteries have to be charged with a constant charge. Wet batteries may be charged using a constant or cyclic charge. Using the wrong charger will ruin the batteries;
- plug the charger into the wheelchair charging point before plugging it into the mains;
- the battery charger may have a mains and a charging indicator light. Check they are both on;
- most chargers have a cut-out and a light indicator which operate when the battery is fully charged;
- take care not to overcharge the batteries as this will reduce their overall life. A battery level indicator on your wheelchair control console will indicate when the batteries require charging. Ideally, they should be recharged when

the indicator reads 20% to 25% charge. Some chargers charge the batteries very quickly for the first few minutes and then slow down. Overcharging may occur if this type of charger is turned on regularly for short periods. It is much better to leave the batteries to charge overnight;

- overcharging causes chemical decay and recharging becomes impossible. New batteries must then be purchased. It takes about three months for the batteries to decay if left uncharged.

But:

- vehicles not in use should be charged once a month;
- vehicles used infrequently should be charged once a fortnight;
- vehicles in constant use should be charged daily. Daily use will increase the life span of the batteries.

## **General points**

- Do not touch both terminals at once with wet hands or place a metal object across the terminals. Although the shock would not be lethal, a small shock can be quite nasty!
- Keep the terminals free from corrosion by smearing with petroleum jelly.
- If replacing the batteries, check that the new ones will fit into the allotted space.

## **POWERED WHEELCHAIRS WITH SPECIAL FEATURES**

Some wheelchairs have special features that allow people to be more independent or provide additional support or comfort. The features available include:

### **AN ELEVATING SEAT**

These wheelchairs are generally used indoors to enable users to reach high level cupboards and shelves, for example. It is usually advised that, for stability, the wheelchair should not be driven with the seat elevated.

### **A STAND-UP MECHANISM**

These wheelchairs stand the user up to a near vertical position. The seat and backrest flatten out (using either a manual or powered control), and the user is stabilised in a standing position via chest and knee straps. As well as increasing reach, these wheelchairs also enable users to raise themselves to a point where they can communicate more easily with others and may also benefit the health of the user by providing some pressure relief and improvement to circulation and fluid drainage.

### **A STAIR CLIMBING FACILITY**

A few wheelchairs have a special mechanism to negotiate flights of stairs, both up and down. Ascent and descent is

controlled by the wheelchair user via a more complex control console.



Although the angle of the seat unit adjusts on the stairway to keep the seat horizontal, users must have good trunk control.

## **A POWERED RECLINING BACKREST**

A reclining backrest is longer and includes a head support section. Backrests that recline manually are commonly available, but can only be operated by an assistant. A powered backrest can be reclined by wheelchair users, increasing their level of independence. A reclining backrest is usually operated in conjunction with elevating leg rests and provides an alternative position for the wheelchair user, useful for resting, pressure reduction and to relieve back pain. The backrest should be returned to an upright position for stability when the wheelchair is driven and to direct the vision of the user forwards.

## **A TILTING SEAT UNIT**

The seat unit in these wheelchairs can be tilted backwards, whilst maintaining a constant angle between the seat and backrest. Like reclining models, the backrests on these styles of wheelchair are longer to provide full-length support for the back and head of the user. The tilting mechanism may be manually operated by an assistant, or powered for independent use. People who have low muscle tone with limited head and trunk control may be better supported in a tilt-in-space wheelchair. It might also be used for resting, for altering weight distribution and to improve comfort. However, users will need to return to the upright position at meal times so that they have better eye contact with other seated people and when driving the wheelchair.

## **A CAR TRANSFER SYSTEM**

Travelling by car if you are an electric wheelchair user can be a problem.



The Car-chair system consists of a specially adapted manual or electric wheelchair which works with a powered

lifting unit, that raises the user and the complete wheelchair into the car into the space previously occupied by the seats of the front passenger or driver. The user remains seated in the wheelchair throughout the transfer.

The Carony system positions the wheelchair user similarly, but the wheelchair seat unit detaches from the wheelchair chassis and the seat alone is transferred into the position of the front passenger or driver.

## WHEELCHAIR ACCESSORIES

The majority of manufacturers supply a range of accessories to accompany their wheelchairs. Typically, cushions, trays, bags and wet weather protection are available. Some suppliers sell universal accessories for use with a range of different wheelchairs.

## INSURANCE

Insurance is not legally required for any powered vehicle in either category - Class 2 for pavement use or Class 3 for pavement and road use. However, it is recommended that wheelchair users have at least public liability insurance, covering accidental damage to other people and property. Some policies cover additional losses from fire, theft and damage and can include a breakdown recovery service.

Sometimes insurance cover can be added to some home contents policies or it can be arranged through independent insurance brokers.

## USEFUL PUBLICATIONS

*Highway Code for Electric Scooter and Wheelchair Users.* Available from the British Healthcare Trades Association.

*The BTA Guide to Buying a Mobility Vehicle.* Available from the British Healthcare Trades Association.

*Code of Practice for Class 3 Vehicles Users.* Available from the Department for Transport, Mobility Advice and Vehicle Information Service.

## USEFUL ADDRESSES

Association of Charity Officers Unicorn House Station Close Potters Bar Herts EN6 3JW  
Tel: 01707 651777  
Fax: 01707 660477  
Email: [info@aco.uk.net](mailto:info@aco.uk.net)

British Healthcare Trades Association – BHTA, New Loom House, Suite 4.06  
101 Back Church Lane  
London E1 1LU  
Tel: 020 7702 2141  
Fax: 020 7680 4048  
Homepage: [www.bhta.com](http://www.bhta.com)  
Email: [bhta@bhta.net](mailto:bhta@bhta.net)

Department of Transport - Mobility & Inclusion Unit  
Zone 4/25, 1st Floor  
Great Minster House  
76 Marsham Street London SW1P 4DR  
Tel: 020 7944 6100  
Fax: 020 7944 6102  
Textphone: 020 7944 6100  
Email: [miu@dft.gsi.gov.uk](mailto:miu@dft.gsi.gov.uk)  
Website: [www.dft.gov.uk/access](http://www.dft.gov.uk/access)

Directory of Social Change  
24 Stephenson Way  
London  
NW1 2DP  
Tel: 020 73914800  
Fax: 020 7391 4808  
Email: [info@dsc.org.uk](mailto:info@dsc.org.uk)  
Website: [www.dsc.org.uk](http://www.dsc.org.uk)

ASSISTUK (formerly DLCC)  
Regional Disabled Living Centre  
Redbank House  
4 St Chads Street  
Manchester M8 8QA  
Tel: 0870 770 2866  
Fax: 0870 770 2867  
Textphone :0870 770 5813  
Email: [general.info@assist-uk.org](mailto:general.info@assist-uk.org)  
Website: [www.assist-uk.org](http://www.assist-uk.org)

Disability Equipment Register  
4 Chatterton Road  
Yate  
Bristol BS37 4BJ  
Tel: 01454 318 818  
Email: [disabreg@blueyonder.co.uk](mailto:disabreg@blueyonder.co.uk)

Website: [www.disabilityequipment.org.uk](http://www.disabilityequipment.org.uk)  
Lexiquip  
Harnhill Cottage  
Waterton Lane  
Ampney Crucis  
Cirencester GL7 5RX  
Tel: 01285 850816

Motability  
Goodman House  
Station Approach  
Harlow  
Essex CM29 2ET  
Tel: 01279 635999  
Fax: 01279 632000  
Helpline: 0845 456 4566  
Website: [www.motability.co.uk](http://www.motability.co.uk)

National Federation of Shopmobility  
The Hawkins Suite  
Enham Place  
Enham Alamein  
Andover  
Hants SP11 6JS  
Tel: 0845 644 2446  
Fax: 0845 644 442  
Email: [info@shopmobilityuk.org.uk](mailto:info@shopmobilityuk.org.uk)  
Website: [www.shopmobility.org.uk](http://www.shopmobility.org.uk)

Mobility Centres  
Derby Mobility Centre  
Kingsway Hospital  
Kingsway  
Derby  
DE22 3LZ  
Tel: 01332 371929  
Email: [info@derbyregionmobilitycentre.co.uk](mailto:info@derbyregionmobilitycentre.co.uk)

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