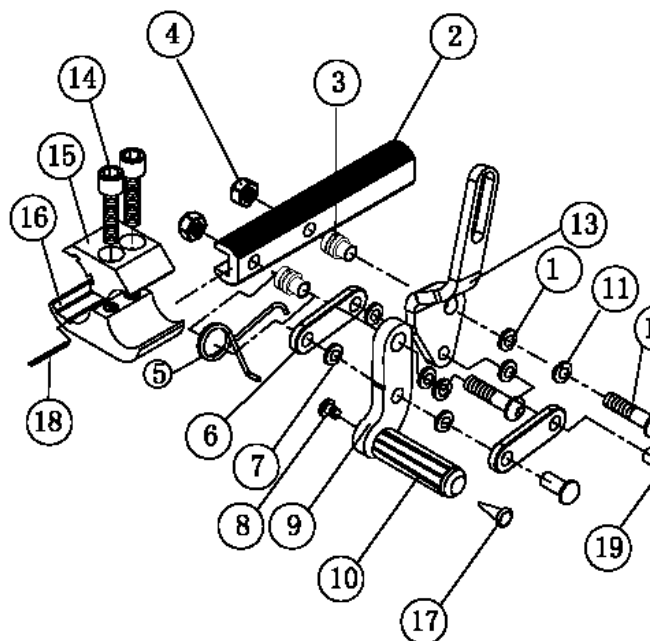
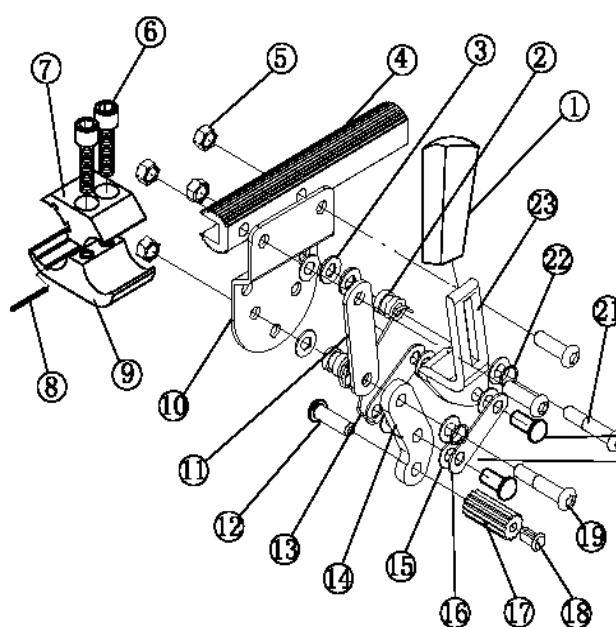


Wheelchair parking brakes

DB1 clamp on hand operated parking brake assemblies are supplied in pairs of left and right. They are mounted on the wheelchair frame according to wheel diameter and position.



The brake clamp jaws are shaped to grip both frame tube and adjustment rail. The inside face of each clamp jaw incorporates a unique gripping tread feature which compresses around the frame tube to reduce risk of brakes damaging the surface, or becoming dislodged from their set operating position. Loosening the two M6 clamp screws allows both clamp and rail to be adjusted. When repositioning brakes, these screws should be tightened alternately for an even clamping pressure.



Parking brakes are fitted to all DB1 wheelchairs. Exploded views of the most common brake assemblies are shown above. On occupant controlled wheelchairs with larger diameter wheels, the brakes (above right) are aligned generally in a parallel to seat.. On attendant only propelled wheelchairs the brake (above left) has an additional alignment mounting plate and linked support strap, which moves the lever pivot downwards, so that the brake is angled towards the lower attendant wheel centres.

Brake position is affected by wheel position and seat to ground height changes. Some very low seat build options can allow a horizontally aligned occupant brake to function in more positions, as the wheel centre moves closer to the brake mounting tube on the wheelchair frame. Unless there are further circumstances arising from a clinical assessment, The correct specification brake is selected by Greencare at the build stage.

Wheelchair parking brakes (continued)

Brakes should exert sufficient pressure on the tyres to hold a 125Kg occupant in a parked wheelchair on an 8 degree safe slope. This is a test, wheelchairs should not be parked on a slope in use. Users should be advised of this.

On heavier occupant weight bariatric chairs rated to 200Kg occupant, the brake parked wheelchair holding slope is 3 degrees, and additional hub braked wheels which primarily have a retardation function, which assists control on slopes, are a safety recommendation. When fitted, retardation hub braked wheels are always an addition to hand operated parking brakes.



On basic toggle action parking brakes, setting distance for wheels with puncture free Greentires is normally 15mm between brake shoe and tyre surface, measured in the off position. When set closer to the wheel, occupant effort and strain on the brake is increased.

A 15mm setting distance achieves brake on and off force standards when the brake is lubricated and tensioned up correctly. Setting distance can be increased slightly for lightweight users to allow easier operation. An extended handle option, detailed in page 3, is also available to reduce operating force.

Toggle action parking brakes are intended to prevent further movement when the wheelchair is already stopped. If applied when the wheelchair is moving, the dynamic forces quickly start to cause excessive wear to brake shoe and tyre, increasing the need for service attention and replacement. Service staff should look out for this and advise users of the correct method of use.

Brake assemblies are secured by nyloc nuts where they need setting for wheel position, and more permanently by rivets in linkage connection areas where possible.

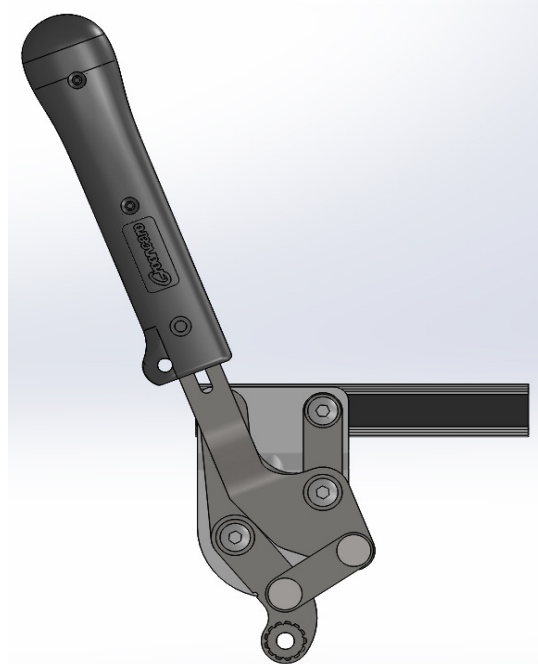
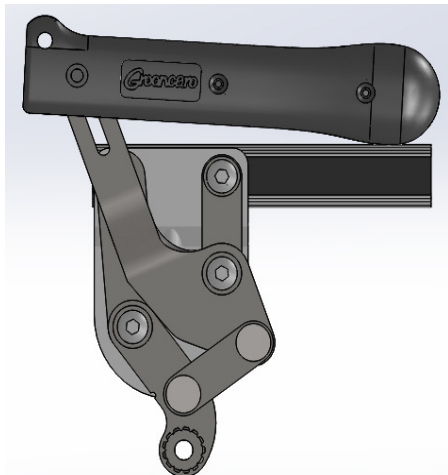
Linkage operation should be lubricated when the chair is serviced. Excessive clearance should be eliminated. Brakes have a return coil spring. A test on ease of operation is that the toggle mechanism locks out when on, and springs back off when released.

Routine servicing should always check brake operation. A graduated slope will not be available for this, and testing with an occupant in the chair is not practical during a short service visit. A rough check of brake effectiveness is to test push the empty chair with the parking brakes applied. If this results in wheels skidding and not turning, the braking force is usually adequate.

Wheelchair parking brakes, with extended handle, (continued)



An extended brake handle is available when force for effective occupant operation is required to be significantly reduced. The extended handle fits directly onto the slotted brake lever with fixing screws. The picture on the left shows an occupant propelled brake setting.



The attendant brake build with extended handle is shown in the drawings. It has the alignment plate and stiffening link. The extended handle can be folded for transfers when pulled upwards in the slot.

The drawing illustrations show a brake fitted with an extended handle in the up position and in the down position. The extended handle is a two piece injection moulding clamped together by M4 screws. When fitting the extended handle, screws should be set, using a hex key, with lubrication added to the slotted area, allowing the occupant to pull it up and down.

On attendant propelled chairs, by making the handle longer it becomes easier for the attendant/carer to kick the brake on and off. This can result in excessive force being applied. Breakages can occur as a result of this type of misuse. Technical personnel should be aware of this, and advise accordingly.

Extended brake handles are frequently fitted to OAD wheelchairs, located so that the occupant can reach across to operate both brake handles using the same hand. If this can be achieved it keeps the chair width to a minimum, and is preferable to fitting the cable operated system described in the next section of this information guide.

Wheelchair parking brakes OAD cable operated types (continued)

Special OAD wheelchair builds may have cable connected brakes fitted. As shown below. The occupant can then apply both brakes from one side.

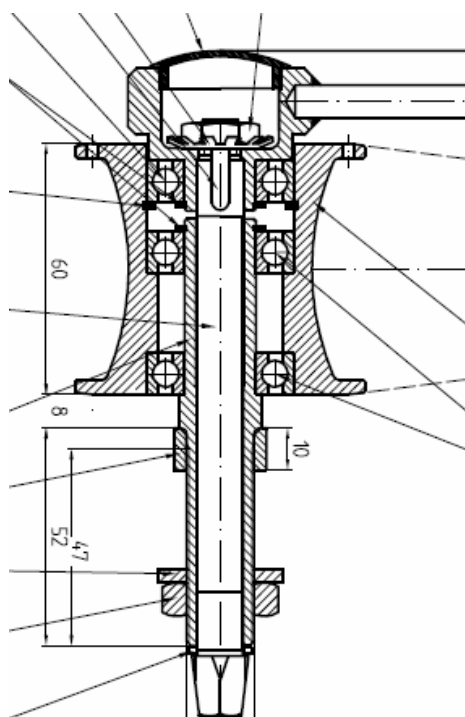


These one side cable brake operating mechanisms are built with different size linkages to reduce the brake shoe travel and increase mechanical advantage

They can be fitted with extended handles to reduce the operating force, for easier operation.

Setting distance of shoe from tyre is just 1mm. This makes these one side cable operated brakes very sensitive to wear variation.

They demand more frequent service attention to maintain effective operation.



The OAD cable brake system requires additional space between wheel and frame to prevent the cable becoming snagged. Cables should be routed across the chair using cable ties in critical positions so that snag contact with moving parts can be avoided.

In 2013 we introduced a spaced off wheel option. Shown in the drawing extract on the left.

The wheel hub build incorporates a 10mm spacer, that makes a space for the brake connection cable to pass through.

This spacer addition increases overall OAD wheelchair width by 10mm. It can be removed for basic OAD builds when cable brakes are not fitted.

Hub Braked Wheels - retardation brakes

These are available on original wheelchair build specification, or in kit form to convert an existing chair should occupant needs change. Fitting a hub braked wheel requires a detailed understanding of assembly and function. We cannot supply these as spares to individuals who have not been trained in DB1 wheelchair service techniques.



Greencare supply hub braked wheels in several sizes for both attendant and occupant propelling wheels. The hub brake function is to allow a carer, who is controlling the chair from the pushing position, a degree of control to slow the wheelchair down. Hub brakes are controlled by lever operated cables from the pushing handle position. They are a build recommendation when the carer is small and the wheelchair occupant is large. Controlling the speed on a downhill slope is a typical function. Hub brakes are also useful, as an additional control feature, when a power pack is fitted.

The Hub Brake is supplied in kit form for retrospective fitting., complete with wheels cables and levers.

Standard build procedure is extended push handles with hub brake hand levers, but for retrospective fitting of an existing chair, it is just possible to fit them on standard length push handles.



Quickly detachable wheels are standard to this application being of benefit both for service access, and reduced lifting weight. The picture on the left shows the brake plate assembly with the wheel removed.

All wheelchairs fitted with hub brakes should also have a standard toggle action brake fitted for parking.

Hub Braked Wheels - retardation brakes

The hub braked wheels should be mounted on the DB1 module, or bottom wheel mounting bracket moulding with the receiver located through the designated wheel mounting position and the brake plate spaced off and located securely against rotation with a separate link fixed to the back plate. Depending on wheel size and position, this link fixing should be screwed in through an existing module fixing hole, or if required a new hole can be drilled into the module block. It is essential that the brake mechanism is secured against rotation.

For installation of Hub Brakes levers, the cables are directed to the push handle using cable ties, and should be routed to prevent it becoming snagged in moving parts of the chair. Removal of the hand grip is required to fit the brake lever to the push handle so that it can be operated by an attendant. When doing this in the field, it usually requires use of a cutting tool to remove the existing handle grip which is destroyed. When replacing a push hand grip, heat should be first applied to soften the material. A defrost programme for a minute in a microwave, or hot water, can be useful, adhesive is needed to finally secure the hand grip.



Braking force is transmitted from the central wheel hub through the wheel spoke and rim to the tyre to ground contact point. In achieving a reliable function the hub brake demands a reliable wheel.

Wheel maintenance requirements are accordingly increased with hub brakes, and spoke security needs to be frequently checked.

For this reason Greencare recommends the rigid double aluminium rim wheel construction with increased diameter spokes on hub braked wheels when the occupant weight is over 150Kg.

For initial installation, the hub brake operating cable should be adjusted to make sure that the hub brakes operate with the brake shoes are set tight against the rotating wheel hub. This allows for a degree of cable stretch and bedding in during the first use operating period.

Simultaneous application of both hand toggle parking brakes and attendant controlled hub brakes increases the total braking force holding a chair in position, and in some practical situations, such as in transportation of heavy occupants, operating both brakes reduces risk of wheelchair movement.