

FEATURE
Handcycling solutions



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HANDCYCLING SOLUTIONS

Touring, commuting, racing or mountain biking, there are hand-cranked tricycles to suit all disciplines and abilities.

Handcyclist **Gary Jackson** offers an overview

Like their Olympic colleagues, Britain's Paralympic cyclists excelled again this summer.

Cycling is the third largest sport in the Paralympics, perhaps because cycles can be adapted to suit almost any rider.

There's more to handcycling than competition, of course. Handcycling can give the rider the opportunity to cycle with friends and family, explore trails, or take part in epic tours. Whatever your aspiration, a handcycle can provide fun, physical fitness and adventure. It can take you to the end of the road or the ends of the earth. Just like a bike, then!

Like a bike, a handcycle is a human powered vehicle but one which is propelled by the muscles of the abdomen, arms, shoulders and chest rather than the legs as on a bike.

Types of trike

Although there are some unusual two-wheel designs, like the Varna Pony and Marathoner, handcycles are generally tricycles. There are two basic configurations: the delta and the tadpole.

The delta configuration, with two rear wheels and drive to a steerable front

wheel, is the most popular design for handcycling by far. Some delta trikes drive the rear wheels instead, normally using a differential.

The steering geometry of a delta is less complex than a tadpole, which makes it light and manoeuvrable. Front wheel drive has less chain length and power transfer feels more direct but, with less weight close to the drive wheel, traction can be an issue on steep hills, loose surfaces and in mud. Rear wheel drive has a really long drive chain, which can feel a bit remote, but weight distribution and power delivery to two wheels gives greater traction.

A tadpole hand-trike has two steerable front wheels and a single trailing rear wheel, which is also the drive wheel. With weight close to the drive wheel, a tadpole gives good traction. Discs brakes on two front wheels allow for more powerful braking with a tadpole but the steering on two wheels may be a little heavier.

Commuting & transport

For trips to the shops, pubs and commuting, the clip-on is perhaps the most versatile handcycle arrangement for

the wheelchair-user who already has, or is considering, a rigid frame wheelchair. The clip-on is a crank-driven cycle fitting that attaches to the front of the wheelchair by means of a docking system. This allows an everyday wheelchair to be transformed into a handcycle and back again.

As a recreational or mobility aid, a clip-on allows the user to travel further and faster than would be possible in a wheelchair alone. It has the additional advantage that, wherever the rider cycles, they also have their wheelchair with them. A clip-on allows a disabled adult or child to remove and secure the cycle fitting and use the wheelchair as normal at the other end of the journey.

A range of clip-ons is readily available in the UK. Da Vinci Mobility offer the Veloce range, from the Veloce 7-speed to the Veloce Sports with 24 gears, 26-inch front wheel with disc and calliper brakes. Prices range from £1,495 to around £1,895 depending on specification. See davincimobility.co.uk.

Team Hybrid supply the Coyote range, including a scaled down version for children. These clip-ons feature a number of gear options, from 7-speed derailleurs,



5 Setting off to do the MinorTaur trail at Coed y Brenin
6 Clip-ons convert a standard wheelchair into a handcycle

“FOR TRIPS TO THE SHOPS OR COMMUTING, A CLIP-ON IS THE MOST VERSATILE”

to 8-speed hub gears and the Sram dual drive. Prices are from £900 to £1600. See teamhybrid.co.uk

Bromakin offer a range of Speedy Bikes. These come with a choice of gear options too, from 7-speed hub gears to a 27-speed Shimano Deore LX drivetrain. Prices from £1,995 up to £3,995 for a power-assisted version. See bromakin.co.uk.

Upright handcycles are like a permanent fusion between the clip-on and a wheelchair. They have the benefit of a high seat, which can make transfers into and out of the machine much easier. Available in both adult and child sizes, an upright allows for a familiar ‘sit up and beg’ riding position, offering a variety of footplate arrangements.

With hub gearing and coaster brake stopping, upright handcycles like the Top End Excelerator (£1,619) and the Li'l Excelerator (£1,650) for children are simple to operate for the casual rider. The Top End website provides details of their full range of handcycles and a list of approved stockists: topendwheelchair.co.uk.

Alternatively, a machine like the Kettwiesel Handbike will provide its owner with a very usable handcycle not only for commuting but many other pursuits too. It has a seating position higher than most handcycles and can be fitted with a crutch holder or a trailer hitch. A standard base machine will cost around £4,055 (subject to currency variations). But with so many options available, including hub dynamos and a Rohloff hub, London Recumbents' Oliver Taylor advises to contact him directly

on 0208 299 6636 to discuss requirements. See londonrecumbents.com.

Leisure & touring

Like their conventional cycling counterparts, touring handcyclists require a machine that is comfortable, robust and with gear ratios that are useful on long steep climbs. Although some handcycles lend themselves well to touring use, most will require some modification to incorporate mudguards and a luggage rack.

A semi-recumbent handcycle allows a riding position that will be comfortable for long periods and, importantly, gives the rider good visibility to enjoy the passing scenery and also observe traffic.

In this category, the Varna II has a well-established pedigree. Jon Amos used one for his Trans-Australia Challenge, when he became the first man to cross the continent by handcycle. I've owned one for ten years and, since my account of a C2C in Cycle a few years ago, I've fitted a Schlumpf Mountain Drive to supplement the hub gears. This provides an ultra-low range of gears to tackle the Lake District hills. I prefer hub gears for touring because I can change gear while stationary – and I never mess up the shifts and grind to a halt on a steep hill. A Varna II costs around £2,250 in the UK.

Alternatively, a Quickie Shark, such as the one that Alan Rayment completed a LEJOG on in 2008, might fit the bill just as well. Base Price: £2,231. The Top End Force 2 or XLT Pro and XLT Jr models are also worth considering. Prices start at £1,995 and £2,695

respectively for the adult bikes; the Junior starts at £1,650.

Loughborough-based Bromakin are agents for all of the above handcycles. See bromakin.co.uk.

Racing

Road races, criteriums and individual time-trials all form part of a full calendar of handcycling events in Britain and across Europe, with competition up to the very highest levels, including the Paralympics.

For racing, fully recumbent designs with almost luge-like seating are popular, the aerodynamic position being favoured for maximum performance and speed. The kneeler, however, is considered to be biomechanically advantageous if the rider has good abdominal mobility and can use their body weight in a push-and-pull rowing style power stroke.

A popular recumbent racing handcycling is the Quickie Shark S, retailing at £2,972. The soon-to-be-introduced Shark RS will cost about £4,500. Racing models from Top End include the Force R at £4,295 and the Force K kneeler at £3,200. For those with very deep pockets, the fabulous, futuristic-looking Carbon option is in the region of £6,500! Again, Bromakin are agents for all of these, and you will have the benefit of the advice of top handcycling racer, Rob Wickham. See bromakin.co.uk

Off-road

Although an off-the-shelf handcycling with knobbly tyres can cope with regular cycle



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7 XCR cross-country handcycle
8 Gary on his Varna II on a Coast to Coast trip



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Photos: Gary Jackson

GO HANDCYCLING

If you would like to try out a handcycle, various organisations offer 'taster sessions' and support information.



CTC's Inclusive Cycling Forum is a good source of information on adaptive or all ability cycling. The information sheet is particularly useful. Go to inclusivecyclingforum.org.uk
More information on CTC projects is at ctc.org.uk > Projects > Disability.
Other useful sites include:
www.handcycling.org.uk
handbikescotland.co.uk
spanglefish.com/wheelhigh
mbwales.com
handcyclingni.com

trails, an off-road or all-terrain handcycle (ATH) is designed to have the strength, durability and ground clearance to cope with much tougher terrain. Some, like the Alaskan Lasher, the Sport-On XCR and the Top End Force CC are of the familiar front-wheel drive delta type but with the seating designed to be more upright and forward, placing plenty of weight on the front drive wheel for greater traction.

Bill Lasher Jr says that his machine will perform exceptionally well when trail riding with mountain bike friends. Steve Hodges can confirm this, having used his both in the Alps and on the roller coaster trails at Coedy-Brenin. Base Price ex works: \$4,995 USD (£3,203). For more details, visit the website lashersport.com and contact Bill directly.

A Sport-On XCR Handcycle is a well-specified machine that includes front and rear hydraulic disc brakes and a choice of derailleur or internal hub gearing as standard. The XCR is also available with the options of its own trailer, for carrying an expedition pack, or an electric drive system. Available in the UK from £2,995.

The Top End Force CC is a fusion between their Force R and Force handcycles but with greater ground clearance. It's currently £3,999 in the UK.

Demonstrators of both the XCR and Force CC are available at Team Hybrid (teamhybrid.co.uk) and Draft Wheelchairs (draftwheelchairs.com) respectively.

For more extreme use off-road use, machines such as the American Titanium Inc. One-Off Handcycle, Reactive Adaptations Bomber, and the Polish-made Explorer II push the boundaries further still. These tadpole handcycles are made for even more hard-core off-road use and give people with disabilities the opportunity to be a part of a full-on mountain biking community.

The rider sits in a bucket seat just in front of the rear wheel, with legs folded back onto supports. A forward leaning position, with traditional handlebar and also chest steering, are characteristics of these machines. Rear-wheel drive and multiple gear and suspension options combine to give these handcycles great climbing traction and tremendous off-road capability. These are the handcycles that have ascended major mountains in the USA and Europe as well as Mt Fuji and Mt Kilimanjaro. So they'll be a bit handy on trails here in the UK!

The One-Off and Bomber are approximately £4,000 ex-works in the USA. The Explorer II, with full independent suspension, is priced from £5,700 in the UK. See teamhybrid.co.uk.

Mixed-ability tandems

An interesting hybrid is the tandem handcycle/cycle combination. Differing frame designs allow the handcyclist to be captain or stoker, according to preference. It's not an eccentric contraption either,

but a serious bit of kit. Paraplegic adventurer and ParalympicGB athlete Karen Darke used her Greenspeed recumbent tandem, 'Green Beast', on tours of New Zealand, Spain, and Asia, including the Karakoram mountains and the Himalayas.

Australian manufacturers Greenspeed make special trikes to order. Director Ian Sims tells me that the standard ex-works tandem price is \$9,990 AUD (£6,444) and the supplement for fitting stoker hand-cranks is \$500 AUD (£325), and for the captain's hand-cranks is \$950 AUD (£619). Although Greenspeed have a UK dealer in Westcountry Recumbents, Ian suggests that anyone interested in a special trike should email him directly at ian@greenspeed.com.au to discuss individual handcycle requirements. See greenspeed.com.au.

Varna manufacture a tandem handcycle/cycle in which the front end pedals, steers and leans independently like a bicycle while the rear, based on their Varna II model, is powered by hand-cranks and does not lean. POA from Bromakin: bromakin.co.uk.

The Kettwiesel Handbike can also be converted into a tandem by fixing one Kettwiesel to another. This requires a tandem coupling costing around £100. See londonrecumbents.com.

Whatever type of handcycle you prefer, it's a great way to get outdoors and have some fun. If you're in the Lake District and you see me out there, give me a wave! ☺