

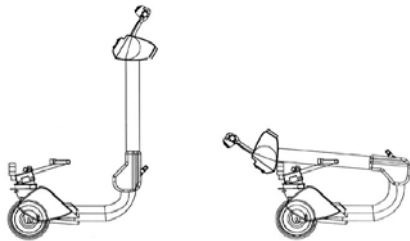
## Product specification (based on most recent prototype)

Electric motor drive to fit common wheelchair types and sizes, offering power, steering and braking

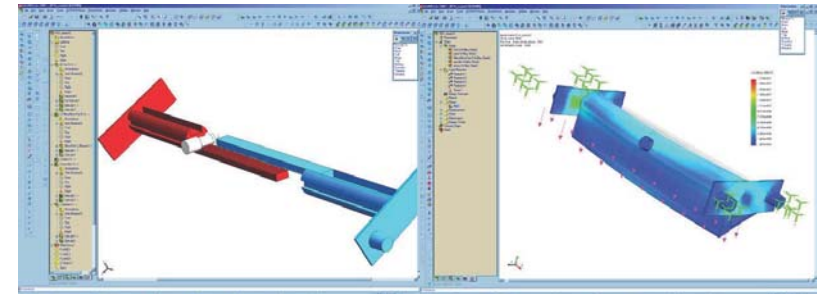
- Provides variable speed drive up to 4 mph (legal maximum) - set by the user or attendant (cruise control style)
- Allows wheelchair to climb & descend ramps, lowered kerbs & reasonable gradients safely
- Allows wheelchair to manoeuvre easily - ideally to turn 'on a sixpence'
- Controllable easily and safely by wheelchair user or an attendant
- Controllable using one hand only, even by attendant
- Controllable by attendant walking alongside chair, alleviating feeling of isolation
- Can be used occasionally or continuously to suit the user
- Easy to remove and reattach
- Can be transferred between different chairs
- Quiet, smooth operation which will not draw unfavourable attention

- Freewheel function
- Parking brake
- Automatic reversing alarm with half-speed reversing for safety
- 24V, 260W Assembled Products Corporation XTi hub motor with internal 22: 1 epicyclic gearbox; 29 lbf ft stall torque
- 4QD NCC-70-24V Mk. II pulse-width modulated reversing controller incorporating regenerative braking function with current limiter
- 2 × 12 V, 10 A hr Yuasa/Ronway/McNair-type sealed gel lead acid motorcycle batteries
- Will propel a standard Remploy 8L wheelchair, with total load of 15 stone (user plus shopping bags), at 2 mph constant speed, up 1 in 7 slope
- Compliance with BS 6935 / ISO 7176 series
- Planned retail ~ £800

### Typical installation on Remploy 8L wheelchair



Finite element analysis used to develop width-adjustable bracket



Electric wheelchairs are expensive & awkward to transport, but many wheelchair users (both self-propelled and those dependent on an attendant or carer) could benefit from power assistance. This is a detachable add-on unit, providing power, steering and braking at a lower cost, to fit 70% of manual wheelchairs. With both user control and attendant control modes, the unit can be swapped between chairs of users with very different capabilities—for example in a hospital or nursing home. Prototypes so far test configurations and motor/drive systems, including brushless motors, hub motors and regenerative braking. Under development—more information at [www.lockton-motor.co.uk](http://www.lockton-motor.co.uk)

# Wheelchair Drive

2004 Motion Drives & Controls Award for Engineering in Product Design  
2005 Cambridge University Entrepreneurs' £1k Business Plan Winner