

User manual

 **GEARWHEEL**



EU Declaration of Conformity

The undersigned, representing the following manufacturer

Gearwheel AB
Org.No. 556696-9696
Flottiljgatan 49, 721 31 Västerås
Sweden

hereby declares that the product

GEARWHEEL

with the basic UDI-DI 735013265GWRA

and the following references

GW22K	GW24K	GW25K
GW22KA	GW24KA	GW25KA
GW22L	GW24L	GW25L
GW22LA	GW24LA	GW25LA

is in conformity with the Medical Device Regulation (MDR) 2017/745 as a class I medical device based on Annex VIII.

Intended purpose: The device is a mechanic drive unit for manual wheelchairs with the intention to provide mobility and flexibility to persons who are unable to walk or have restrictions on walking. The device is intended for indoor and outdoor use.

This EU declaration of conformity is issued according to Annex IV in MDR and under sole responsibility of the manufacturer.

Uppsala, Sweden, 2021-05-25



Lars Tenerz
CEO

If you are visually impaired, this document can be viewed in pdf-format at www.decon.se

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1. Introduction

GEARWHEEL is very pleased that you have chosen our wheels for your wheelchair. We are committed to developing a strong relationship with users based on a positive experience, both in the use of their wheelchairs and in their dealings with us as a company, GEARWHEEL's geared wheelchair wheels are designed to make propelling easier in widely varying terrains and situations. The mechanical solution offers a choice of gear ratios with the huge added benefit of an integrated hill-holder. The gearchange is operated with a shift lever on the outside of the wheels. The wheels incorporate a quick release, operated by a user-friendly hoop.

We also encourage you to read the operating manual for your particular wheelchair model where important information is available regarding proper wheelchair use.

2. Intended users

GEARWHEEL's geared wheelchair wheels are intended for personal and everyday use, both indoors and outdoors, for users who have limited mobility or cannot walk. GEARWHEEL's wheelchair wheels are tested for a user weight of up to 125 kg. GEARWHEEL's geared wheelchair wheels are intended for use on a range of different wheelchair models and only in conjunction with the appropriate GEARWHEEL designed adaptors.

3. Contact

For matter regarding customer service, delivery, please contact:

DeconWheel AB
Södra Ekeryd 119
314 93 Hyltebruk

info@decon.se
www.decon.se
Tel: +46 (0)345-40 880

For matter regarding product, construction and CE-marking, please contact:

Gearwheel AB
Flottiljgatan 49
721 31 Västerås

info@gearwheel.se
www.gearwheel.se
Tel: +46 (0)70-69 59 427

4. Description

GEARWHEEL has developed a solution with fully mechanically geared wheelchair wheels that can be mounted on existing wheelchairs on the market. The patented solution combines the ability to shift to different gears on the wheelchair within a design that is not significantly different from ordinary wheelchair wheels.

Gear-changing makes possible a greater self-propelling capability. The difference can be great for certain user groups and can be significant where ground level differences, thresholds, carpeting, lawns or maybe the last incline to ones home is a natural part of everyday life.

A shifter on each wheel changes gear between two different ratios, direct drive (1:1) and a lower ratio. Added to this is an integrated hill-holder. The wheels are supplied with an adaptor, specific to each wheelchair model, that enables the correct functioning of the gears.



5. Warnings



Warning

Using GEARWHEEL can affect the chair's balance and its tipping sensitivity.



Warning

Read and carefully follow the instructions in the GEARWHEEL manual as well as the instructions contained in the wheelchair manufacturer's User Manual for the specific wheelchair model.



Warning

Risk of injury in the center of the wheel hub, where there is a gap between the spoke guard and the center of hub.



Warning

Risk of tipping backwards when the gear is in reverse lock position, Hill-holder. Never use the chair without anti-tippers.



Warning

The product is not crash-tested and is therefore not intended to be used for transport in vehicles.





Important

6. Safety precautions

Check delivered products

- Check the products supplied by GEARWHEEL.

Make sure you have one pair (2 units) of geared wheelchair wheels.

- Make sure you have one pair of the correct adaptors for your specific wheelchair model.
- Make sure you have the correct hand rims.

Check GEARWHEEL's equipment

Ensure the following:

- The wheels' axles are easy to move in and out of their receivers.
- The wheels are attached properly after assembly on the wheelchair, both in neutral and shifted position.
- The Quick Release hoop on the outside of the wheel locks the wheel when not lifted up.
- None of the four wheels on the wheelchair is in the air when the chair is on a flat surface.
- The rotation lock is in the correct position. This means that the peg on the inside of each wheel is properly inserted in the hole in the adaptor when the wheel is attached, see figure 8.7.

Balance and tipping sensitivity

The ability to change gear on the wheelchair and the engagement of the hill-holder can adversely affect the balance and tipping sensitivity.



Warning



Warning

Operating Instructions

Before using GEARWHEEL: Read and follow the instructions in the user manual.

In addition to the instructions that come from the wheelchair manufacturer, it is important that you practice using your geared wheelchair wheel. Anti-tip stabilisers **MUST** be used. Take the proper time to familiarise yourself with your new wheels so that you are as comfortable as possible with the various conditions that the gearing options provide. If you have any questions about using GEARWHEEL geared wheels on your wheelchair, please feel free to contact us or your local sales representative.

Gear lever and finger pinching hazard

Risk of finger pinching between the shift lever and the spoke guard. Never use the wheels without the spoke guards.

Risk of finger pinching at the center of the wheel hub, where there is a gap between the spoke guard and the hub.



Warning



Wheel and gear management

- To remove the wheels, the gear should preferably be in the direct drive (1:1) position (the gear lever is in the vertical position).
 - It is possible to change gear both when stationary and in motion. However, the gearbox works more smoothly when the wheelchair is in motion.
 - Check that the wheel is attached by pulling the wheel outwards and even shifting gears once, and ensure that the wheel does not slide out from its mounting on the chair.
 - Inspect GEARWHEEL's geared wheelchair wheels once a month as instructed in Section 8.
-

7. Overview - drive wheel

1. Hand rim

2. Gear lever

3. Spoke guard
-not visible in picture

4. Quick release
- QR-hoop



1. Hand rim

2. Gear lever

3. Spoke guard – not visible in picture

4. Quick release – QR-hoop



8. Operation

Gear changing

The gearbox has three positions: direct drive (1:1), low gear, and low gear + hill hold.

- Direct drive (1:1) – As in a regular wheel where the hand rim rotates at the same speed as the wheel
- Low gear – The hand rim rotates faster than the wheel, reducing the effort required to push the chair by about 40%.
- Low gear + hill hold – In addition to the lower gear, the wheels are locked from rolling backwards. Note that this greatly increases the risk of tipping backwards, since the user cannot control the balance of the wheelchair in the normal way.

To select low gear, move the shift lever forward as far as it will go (Figure 8.1) To switch back to direct drive (1:1), move the shift lever backward until it reaches its vertical position (Figure 8.2). To switch to reverse lock (hill-holder) mode, move the shift lever backward (Figure 8.3). To switch back to 1: 1, push the shift lever forward to its vertical position (Figure 8.4)



Fig 8.1 - Left wheel

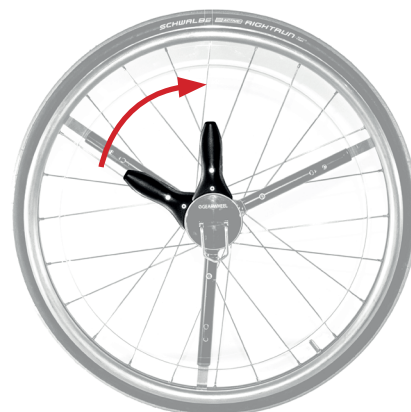


Fig 8.2 - Left wheel

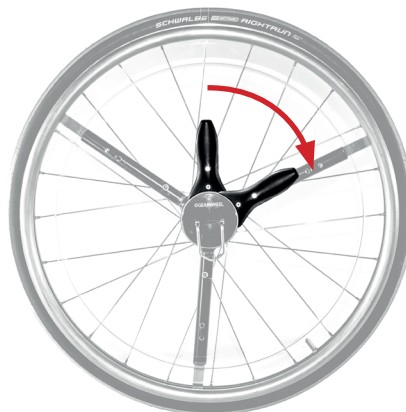


Fig 8.3 - Left wheel

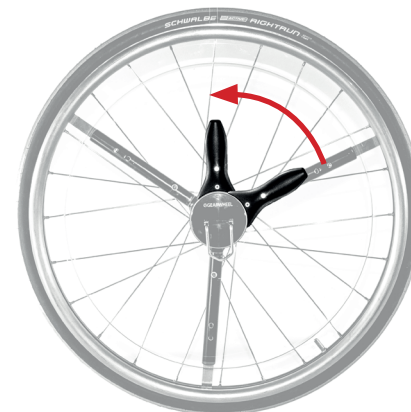


Fig 8.4 - Left wheel



Warning

Risk of tipping backwards increases when the gear is in reverse lock/ hill-holder mode. Tipping protection must be used.

- It is possible to shift gears when in stationary position but it is easier and more convenient to shift when in motion.
- The hill-hold function shall be used regularly, at least once a week to ensure full functionality.



 Important

It is possible to shift gears both while stationary and when in motion. However, the gearbox works more smoothly when the wheelchair is in motion.

Remove and secure the wheels

Unlock the wheels by lifting the QR-hoop (Figure 8.5) and pull the wheel straight out (Figure 8.6). To re-fix the wheel lift the QR-hoop, insert the wheel axle in its receiver on the chair whilst at the same time engaging the peg on the wheel's rotation arm with the receiver in the adaptor on the wheelchair (Figure 8.7). The wheel's QR-hoop then drops down to its parked position and the wheel is locked in place (Figure 8.8).



Fig 8.5



Fig 8.6



Fig 8.7



Fig 8.8

- It is preferable to remove the wheel when the gear lever is in the direct drive (1:1) position.
- Check that the wheel is attached to the chair by pulling it outwards and even shifting gears once to see that it does not slide out.
- Make sure the rotation lock is properly fitted. The peg on the rotation arm is engaged in the receiver in the adaptor on the wheelchair.

 Important

9. Settings

The wheelchair settings and adjustments are made according to the wheelchair manufacturer's instructions. GEARWHEEL wheelchair wheels provide the user with the unique ability to change gear. Although the GEARWHEEL gearbox design is designed to require no adjustment, the user is advised to check the wheelchair and the adaptors if the system is not operating normally.



10. Maintenance and care

GEARWHEEL recommends, in addition to the instructions given by the wheelchair manufacturer for the wheelchair model, the following maintenance.

Monthly

- Check the pressure in the tyres. Unscrew the valve cap and reinflate the tyre. Maximum tyre pressure is 9 bar. Check for any damage and wear. If solid tyres are used check for cracks due to age or wear.
- Check that the brakes/wheel locks function normally and satisfactorily.
- Use a mild detergent to clean the parts of the wheel. Lubricate moving parts very lightly with suitable lubricant after washing. (light oil, e.g. 3-in-1)
- Thoroughly clean the quick-release axles and lubricate very lightly. Rain, sand, salt, debris, or prolonged periods in which the wheels are not removed mean cleaning and lubrication need to happen more often.
- Check that the screws and nuts are tightened.
- Check that the shift lever locks in its end positions (Downshift and downshift + hillhold) and that the gear shift works correctly in each gear.
- Check the gear system for damage. In case of damage to wheels and gear mechanism, contact Decon AB, or a Decon appointed.

Information about corrosion

All gearwheel parts that may be subject to corrosion are made of aluminium, stainless steel or steel. The materials and the transitions between the materials have been surface-treated, which is why there is no increased risk of corrosion.

11. Transport in vehicles

The product is not crash-tested and is therefore not intended to be used for transport in vehicles

12. Warranty and service life

GEARWHEEL provides 2 years of factory warranty on drive wheel hub, gear assembly, with the exception of gear shift and adaptor systems. Other items, 12 months, with the exception of wearing parts.

The expected service life of the complete product (not wearing parts) is five years from the date of sale.

13. Waste management and recycling of materials

The following is a description of the materials in GEARWHEEL construction, with regard to possible waste disposal and recycling of materials.

- Aluminium: Hub, wheel rim, handrim (depending on the model), brackets
- Rubber: tires, handrim (depending on the model)



- Plastic: spoke guard, gear lever, handrim (depending on the model)
- Steel: screws, springs, front axle in gear system, spokes, quick release axles, shift handle

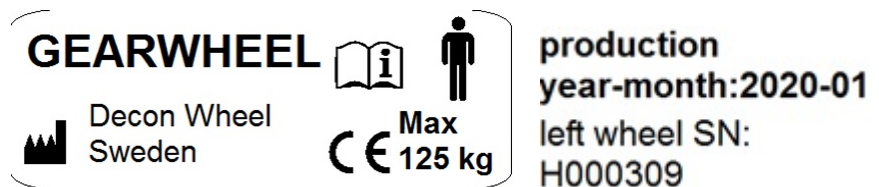
When GEARWHEEL has reached the end of its service life and needs to be scrapped, contact the local authority for information on recycling and follow their instructions. Alternatively, you can contact your retailer to recycle your used GEARWHEEL.

When GEARWHEEL is to be transferred to a new user, all technical documents must also be transferred. The product must be cleaned by a professional, disinfected and serviced.

14. Marking plate

The marking plate is located on the GEARWHEEL wheel. The exact designation and technical specifications relating to the product are indicated on the nameplate. When contacting Decon, please quote the serial number (labeled SN).

EXAMPLE



	2016-12	Manufacturing date
	H000309	Serial number
		Manufacturing company
		Max load
		CE mark
		Operating instructions

15. Technical Specifications

Weight without hand rim and without tire: 2551 g

Wheelsizes: 22", 24" and 25"

Chair's adjustable width increase: approx. 3 cm

Max User Weight: 125 kg

CE marking: 93/42/EEC

Type of tyres: Pneumatic tyres: Dimension 24x1, 25-540, max bar 9.

Tyre punctures: Replace with product that meets the specification.
Contact your medical equipment supplier if needed.

16. Information about product safety and recall issues

Contact the reseller where the product was purchased or the manufacture of GEARWHEEL for information about product safety or any recall information.



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