

# TRANSLATION OF THE ORIGINAL OPERATING INSTRUCTIONS

IMPORTANT

READ CAREFULLY BEFORE USE

KEEP SAFE TO CONSULT AT A LATER DATE



**brose**

# HERCULES



Pedelecs

PASERO SPORT I-10, PASERO COMP I-12,  
PASERO COM I-F5, PASERO PRO I-12

20-Q-0037, 20-Q-0038, 20-Q-0039, 20-Q-0094, 20-Q-0094, 20-Q-0095, 20-Q-0095, 20-Q-0096, 20-Q-0096,  
20-Q-0100, 20-Q-0101, 20-Q-0102, 20-Q-0103, 20-Q-0104

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# 1 About these operating instructions

## Thank you for your trust!

HERCULES pedelecs are sporting equipment of the highest quality – you have made a good choice. Your specialist dealer has advised you and assembled your product. Whether maintenance, servicing, conversion or repair, your specialist dealer will also be happy to assist you in the future.

### Notice

The *operating instructions* are not a substitute for personal instruction by the supplying specialist dealer.

The *operating instructions* are an integral part of the pedelec. Therefore, if it is re-sold at a later time, they must be handed over to the subsequent owner.

You receive these *operating instructions* with your new pedelec. Please take a little time to become familiar with your new pedelec and follow the tips and suggestions in the *operating instructions*. They will help you to enjoy your HERCULES pedelec for a long time to come. We hope you have fun and wish you well on all of your rides!

These operating instructions are designed for the rider and the operator of the pedelec to ensure that non-professionals can use the pedelec safely.



Instructions for the specialist dealer are highlighted in grey and marked with a symbol. Specialist dealers have specialist training and qualifications and are thus able to identify risks and prevent hazards which may arise during maintenance, servicing and repairs on the pedelec. Information for specialist staff does not require non-professionals to take any action.

You can download the *operating instructions* onto your mobile phone at the following address, so that you can use them when you are out riding:



<https://www.hercules-bikes.de/de/de/index/downloads.html>

## 1.1 Manufacturer

The pedelec manufacturer is:

HERCULES GMBH  
Longericher Straße 2  
50739 Köln, Germany

Tel.: +49 4471 18735 0  
Fax: +49 4471 18735 29  
E-mail: [info@hercules-bikes.de](mailto:info@hercules-bikes.de)  
Internet: [www.hercules-bikes.de](http://www.hercules-bikes.de)

## 1.2 Type number and model

The *operating instructions* are an integral part of pedelecs with the following type numbers:

Type no.	Model	Pedelec type
20-Q-0037	PASERO SPORT I-10 HE	City and trekking bicycle
20-Q-0038	PASERO SPORT I-10 TR	City and trekking bicycle
20-Q-0039	PASERO SPORT I-10 ZR	City and trekking bicycle
20-Q-0094	PASERO COMP I-12 HE	City and trekking bicycle
20-Q-0094	PASERO COMP I-12 HE	City and trekking bicycle
20-Q-0095	PASERO COMP I-12 TR	City and trekking bicycle
20-Q-0095	PASERO COMP I-12 TR	City and trekking bicycle
20-Q-0096	PASERO COMP I-12 ZR	City and trekking bicycle
20-Q-0096	PASERO COMP I-12 ZR	City and trekking bicycle
20-Q-0100	PASERO COM I-F5 HE	City and trekking bicycle
20-Q-0101	PASERO COM I-F5 ZR	City and trekking bicycle
20-Q-0102	PASERO PRO I-12 HE	City and trekking bicycle
20-Q-0103	PASERO PRO I-12 TR	City and trekking bicycle
20-Q-0104	PASERO PRO I-12 ZR	City and trekking bicycle

Table 1: Type number, model and pedelec type

### 1.3 Identifying the operating instructions

You will find the *operating instructions* identification number at the bottom left-hand side of each page. The identification number consists of the document number, the version number and the release date.

Identification number	MY20H01-22_1.0_28.05.2019
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Table 2: Identification number

### 1.4 Laws, standards and directives

The *operating instructions* comply with the essential requirements specified in:

- Machinery Directive 2006/42/EC
- Electromagnetic Compatibility Directive 2014/30/EU
- ISO/DIS 20607:2018 Safety of machinery – Instruction handbook – General drafting principles
- EN 15194:2018 Cycles – Electrically power assisted cycles – pedelec bicycles
- EN 11243:2016, Cycles – Luggage carriers for bicycles – Requirements and test methods
- EN ISO 17100:2016-05, Translation Services – Requirements for translation service.

### 1.5 Subject to change

The information contained in these *operating instructions* are the approved technical specifications at the time of printing. Any significant changes will be included in a new issue of the *operating instructions*.

You will find any modifications to these *operating instructions*:

[www.bulls.de/service/downloads](http://www.bulls.de/service/downloads).

### 1.6 Language

The *original operating instructions* are written in German. A translation is not valid without the *original operating instructions*.

### 1.7 For your safety

The pedelec's safety concept comprises four elements:

- rider and/or operator instruction, and pedelec maintenance and repair by the specialist dealer
- the section on general safety
- the warnings in these *operating instructions*
- the safety markings on the nameplate and the pedelec.

#### 1.7.1 Instruction, training and customer service

The supplying specialist dealer will provide customer service. Contact details can be found on the back page of these *operating instructions* and on the data sheet. If you are unable to contact your specialist dealer, you will find other specialist dealers online at [www.hercules-bikes.de](http://www.hercules-bikes.de).

The rider or the operator of the pedelec will be instructed on the pedelec's functions in person when the supplying specialist dealer hands over the pedelec, if not before. In particular, this instruction will cover the pedelec's electrical functions and correct use of the charger.

Each rider to whom this pedelec is provided must receive instruction on the pedelec's functions. A printed copy of these *operating instructions* must be provided to each rider, who must take note of and observe them.

#### 1.7.2 Basic safety instructions

These *operating instructions* explains all general safety instructions in Section 2 on Safety.

### 1.7.3 Warnings

Hazardous situations and actions are marked with warnings. The warnings in these *operating instructions* are indicated as follows:



Will lead to serious or even fatal injuries if ignored. High-risk hazard.



May lead to serious or even fatal injuries if ignored. Medium-risk hazard.



May lead to minor or moderate injuries. Low-risk hazard.



May lead to material damage if ignored.

### 1.7.4 Safety markings

The following safety markings are used on the pedelec's nameplates:



	General warning
	Adhere to the instructions for use

Table 3: Meaning of safety markings

## 1.8 For your information

### 1.8.1 Instructions for actions

Instructions for actions are structured in accordance with the following pattern:

- ✓ Requirements (optional)
- ▶ Instruction for action
- ⇒ Result of the action (optional)

### 1.8.2 Language conventions

The pedelec described in these *operating instructions* may be equipped with alternative equipment. The pedelec equipment is defined by its respective type number. Where applicable, the word *Alternative* beneath the heading indicates alternatively used components. The following terms are used for better legibility:

Term	Meaning
<i>Instruction handbook</i>	Original operating instructions or translation of the original operating instructions
Pedelec	Electric motor driven cycle
Motor	Drive motor

The following conventions are used in these *operating instructions*:

Convention	Use
<i>Italics</i>	Glossary terms
SPACED	Indicators on the <i>display screen</i>
[▷ <i>Example, page numbering</i> ]	Cross references
•	Bulleted lists

## 1.9 Nameplate

The nameplate is situated on the frame. You will find the precise position of the nameplate in Figure 2. You will find thirteen pieces of information on the nameplate.

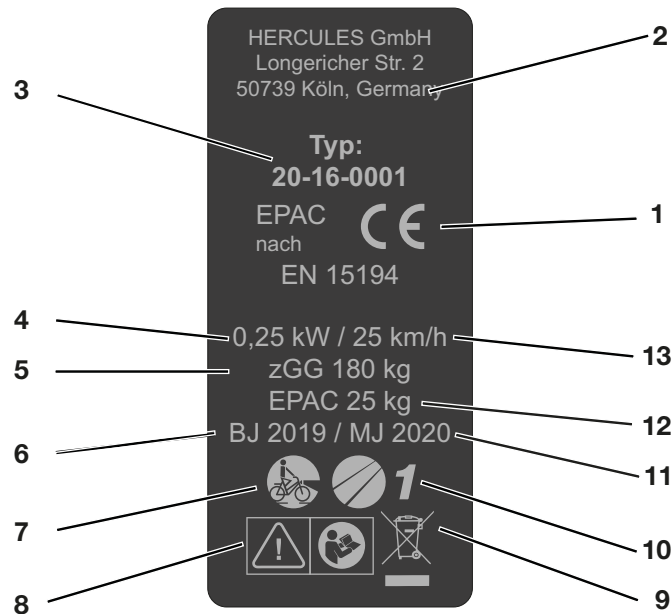


Figure 1: Nameplate, example

No.	Designation	Description
1	CE marking	The manufacturer uses the CE marking to declare that the pedelec complies with applicable requirements.
2	Manufacturer's contact details	You can contact the manufacturer at this address. You can find more information in Section 1.1.
3	Type number	All pedelec models have an eight-digit type number, which is used to specify the design model year, the type of pedelec and the version. You can find further information in Section 1.9.1.
4	Maximum continuous power	The maximum continuous power is the maximum power for the electric motor output shaft during 30 minutes.
5	Permitted total weight	The permitted total weight is the weight of the fully assembled pedelec with the rider and baggage.
6	<i>Year of manufacture</i>	The <i>year of manufacture</i> is the year in which the pedelec was manufactured. The production period is from August 2019 to July 2020.
7	Pedelec type	You can find further information in Section 1.9.3.
8	Safety markings	You can find more information in Section 2.6.
9	Disposal instructions	You can find more information in Section 9.
10	Area of use	You can find further information in Section 1.9.4.
11	Model year	The model year refers to the first production year that the series-manufactured pedelec was produced in the version and is not always identical with the <i>year of manufacture</i> . The <i>year of manufacture</i> may be before the model year in some cases. If no technical modifications are introduced to the series, production may continue of pedelecs from a previous model year.
12	Weight of ready-to-ride pedelec	The indicated weight for a ready-to-ride pedelec refers to the weight of a pedelec at the time of sale. The weight of each additional accessory must be added to this weight.
13	<i>Shut-off speed</i>	Speed reached by the pedelec at the moment when the current has dropped to zero or to the no load current value.



### 1.9.1 Information on the nameplate

Alongside the warnings, product nameplates also contain other important information about the pedelec:













		Read the instructions
		Separate collection of electrical and electronic devices
		Separate collection of batteries
		Must not be thrown into fire (burning prohibited)
		Battery must not be opened
		Device of protection class II
		Only suitable for use indoors
		Fuse (device fuse)
		EU conformity
		Recyclable material
		Protect from temperatures above 50 °C and direct sunlight

Table 4: Relevance of safety instructions

## 2 Safety

### 2.1 General warnings

#### WARNING

##### **Risk of fire and explosion due to faulty battery**

The safety electronics on a damaged or faulty battery may fail. The residual voltage can cause a short circuit. The battery may self-ignite and explode.

- ▶ Remove batteries with external damage from service immediately and never charge them.
- ▶ Only operate the battery and accessories if they are in perfect condition.
- ▶ Only use batteries which are approved for use on your pedelec.
- ▶ Do not use the battery with defective connecting cables or defective contacts.
- ▶ Use the battery with BMZ Systems e-bikes only. This is the only way that the battery will be protected from dangerous overloading.
- ▶ If the battery becomes deformed or begins to smoke, keep at a safe distance, disconnect the power supply at the socket, and notify the fire service immediately.
- ▶ Never extinguish a damaged battery with water or allow it to come into contact with water.
- ▶ If a battery is dropped or struck but shows no signs of external damage, remove it from service and observe it for at least 24 hours.
- ▶ Faulty batteries are hazardous goods. Dispose of faulty batteries properly and as quickly as possible.
- ▶ Store in a dry place until disposal. Never store in the vicinity of flammable substances.
- ▶ Never open or repair the battery.
- ▶ Charge the battery before use. Only use the charger included in the scope of delivery.

#### WARNING

- ▶ Avoid wide temperature fluctuations.
- ▶ Do not use the battery at altitudes higher than 2,000 m.

#### CAUTION

##### **Electric shock in case of damage**

Damaged chargers, cables and plug connectors increase the risk of electric shock.

- ▶ Check the charger, cable and plug connector before each use. Never use a damaged charger.

##### **Risk of fire and explosion due to short circuit**

Small metal objects may jumper the electrical connections of the battery. The battery may self-ignite and explode.

- ▶ Keep paper clips, screws, coins, keys and other small parts away and do not insert them into the battery.

##### **Risk of fire and explosion due to incorrect charger**

Batteries which are recharged with an unsuitable charger may become damaged internally. This may result in fire or an explosion.

- ▶ Only ever use the battery with the supplied charger.
- ▶ Mark the supplied charger clearly to prevent mix-ups – with the pedelec *frame number* or *type number*, for example.

## CAUTION

### **Risk of fire and explosion due to penetration by water**

The battery is only protected from simple spray water. Penetration by water can cause a short circuit. The battery may self-ignite and explode.

- ▶ Never immerse the battery in water.
- ▶ If there is reason to believe that water may have entered into the battery, the battery must be removed from service.

### **Risk of fire and explosion due to high temperatures**

Excessively high temperatures will damage the battery. The battery may self-ignite and explode.

- ▶ Protect the battery against heat.
- ▶ Never expose the battery to sustained direct sunlight.

### **Fire caused by overheated charger**

The charger heats up when charging the battery. In case of insufficient cooling, this can result in fire or burns to the hands.

- ▶ Never use the charger on a highly flammable surface (e.g. paper, carpet etc.).
- ▶ Never cover the charger during the charging process.

Never leave the battery unattended during charging.

### **Electric shock caused by penetration by water**

If water penetrates into the charger, there is a risk of electric shock.

- ▶ Never charge the battery outdoors.

## **Notice**

If you leave a key inserted when riding or transporting the pedelec, it may break off or the locking system may open accidentally.

- ▶ Remove the key from the battery lock immediately after use.
- ▶ We recommend that you attach the key to a key ring.

## 2.2 Toxic substances

### WARNING

#### **Intoxication from suspension oil**

Suspension oil in the rear frame damper is toxic to the touch, irritates respiratory tracts and causes cancer, sterility and mutation in germ cells.

- ▶ Never disassemble the rear frame damper.
- ▶ Never allow suspension oil to come into contact with the skin.

### CAUTION

#### **Chemical burns to the skin and eyes caused by faulty battery**

Liquids and vapours may leak from damaged or faulty batteries. They can irritate the airways and cause burns.

- ▶ Avoid contact with leaked liquids.
- ▶ Ventilate with fresh air and consult a doctor if you suffer any pain or discomfort.
- ▶ Immediately consult a doctor in case of contact with the eyes or any discomfort.
- ▶ In case of contact with the skin, rinse off immediately with water.
- ▶ Ventilate the room well.

#### **Hazard for the environment due to leaking brake fluid**

The brake system contains a toxic, environmentally harmful brake fluid. Such fluids will contaminate if they enter the sewers or groundwater.

- ▶ The brake system must be repaired immediately if brake fluid leaks out. Contact your specialist dealer about repair.
- ▶ Dispose of leaking brake fluid in an environmentally responsible way in accordance with statutory regulations. Ask a specialist dealer for more information.

 **CAUTION**

### Environmental hazard posed by oil and lubricants from the fork

The fork contains toxic, environmentally harmful oils and lubricants. Such fluids will contaminate if they enter the sewers or groundwater.

- ▶ The fork must be repaired immediately if oils and lubricants are leaking out. Contact your specialist dealer about repair.
- ▶ Dispose of leaked oils and lubricants in an environmentally responsible way in accordance with statutory regulations. Ask a specialist dealer for more information.

### Environmental hazard posed by oil and lubricants from rear frame damper

The rear frame damper contains toxic and environmentally harmful oils and lubricants. Such fluids will contaminate if they enter the sewers or groundwater.

- ▶ Dispose of oils and lubricants which have leaked from the rear frame damper in an environmentally responsible way in accordance with statutory regulations. Ask a specialist dealer for more information.

## 2.3 Requirements for the rider

If there are no legal requirements for riders of electrically power-assisted cycles, we recommend that the rider should be a minimum 15 years of age and have experience with muscle-powered bicycles.

The rider's physical and mental abilities must be adequate to use a muscle-powered bicycle.

## 2.4 Protection for vulnerable groups

You must keep battery and charger away from children and people with reduced physical, sensory or mental capabilities or lacking in experience and knowledge.

If minors are to use the pedelec, comprehensive instruction should be provided by or in the presence of the legal guardians. Supervised use should also be scheduled until it is certain that the pedelec is being used as per these *operating instructions*.

## 2.5 Personal protective equipment

We recommend that you wear a suitable cycling helmet. We also recommend that you wear sturdy footwear and typical, close-fitting clothing for bicycles.

## 2.6 Safety markings and safety instructions

The nameplate contains the following safety markings and safety instructions:



Symbol	Explanation
	General warning
	Adhere to the instructions for use

Table 5: Meaning of safety markings












Symbol	Explanation
	Read the instructions
	Separate collection of electrical and electronic devices
	Separate collection of ordinary and rechargeable batteries
	Must not be thrown into fire (burning prohibited)
	It is forbidden to open any batteries
	Device of protection class II
	Only suitable for use indoors
	Fuse (device fuse)
	EU conformity
	Recyclable material
	Protect from temperatures above 50 °C and direct sunlight

Table 6: Relevance of safety instructions

## 2.7 Emergency

### 2.7.1 What to do in an emergency

- ▶ In the event of a hazard or danger in road traffic, apply the brakes on the pedelec until it comes to a halt. The brake acts as an emergency stop system in such cases.

### 2.7.2 First aid measures

Symptoms which are caused by combustion gases or leaking fluids require medical attention.

#### After inhalation

Vapours may emit if the battery is damaged or used improperly. Get into fresh air and consult a doctor if you suffer any pain or discomfort. The vapours may cause respiratory tract irritation.

#### After skin contact

Remove any solid particles immediately. Rinse the affected area with plenty of water for at least 15 minutes. Then dab the affected skin gently. Do not rub dry. Remove contaminated clothing immediately. Immediately consult a doctor if there is any redness or abnormalities.

#### After contact with eyes

Rinse eyes with plenty of water for at least 15 minutes. Protect unaffected eye. Seek medical advice immediately.

#### After swallowing

Drink plenty of milk or water and induce vomiting. Seek medical advice immediately.

### 2.7.3 Fighting fire

#### WARNING



#### Intoxication

Inhaling vapours can cause intoxication.

- ▶ Stand on the side of the fire where the wind is coming from.
- ▶ Use breathing apparatus if possible.

The safety electronics on a damaged or faulty battery may fail. The residual voltage can cause a short circuit. The battery may self-ignite and explode.

- ▶ Keep your distance if the battery becomes deformed or starts to emit smoke.
- ▶ Evacuate everyone from the immediate area of the fire.
- ▶ Contact the fire service immediately!
- ▶ Use Class fire extinguishers to put out the fire.
- ▶ Never extinguish damaged batteries with water or allow them to come into contact with water.

## **2.7.4 Leaking fluids**

### **2.7.4.1 Brake fluid**

- ▶ The brake system must be repaired immediately if brake fluid leaks out. Contact your specialist dealer about repair.
- ▶ Dispose of leaking brake fluid in an environmentally responsible way in accordance with statutory regulations. Ask a specialist dealer for more information.

### **2.7.4.2 Oils and lubricants from the fork**

- ▶ The brake system must be repaired immediately if brake fluid leaks out. Contact your specialist dealer about repair.
- ▶ Dispose of leaking brake fluid in an environmentally responsible way in accordance with statutory regulations. Ask a specialist dealer for more information.

### **2.7.4.3 Oils and lubricants from the rear frame damper**

- ▶ Dispose of oils and lubricants which have leaked from the rear frame damper in an environmentally responsible way in accordance with statutory regulations. Ask a specialist dealer for more information.

### 3 Overview

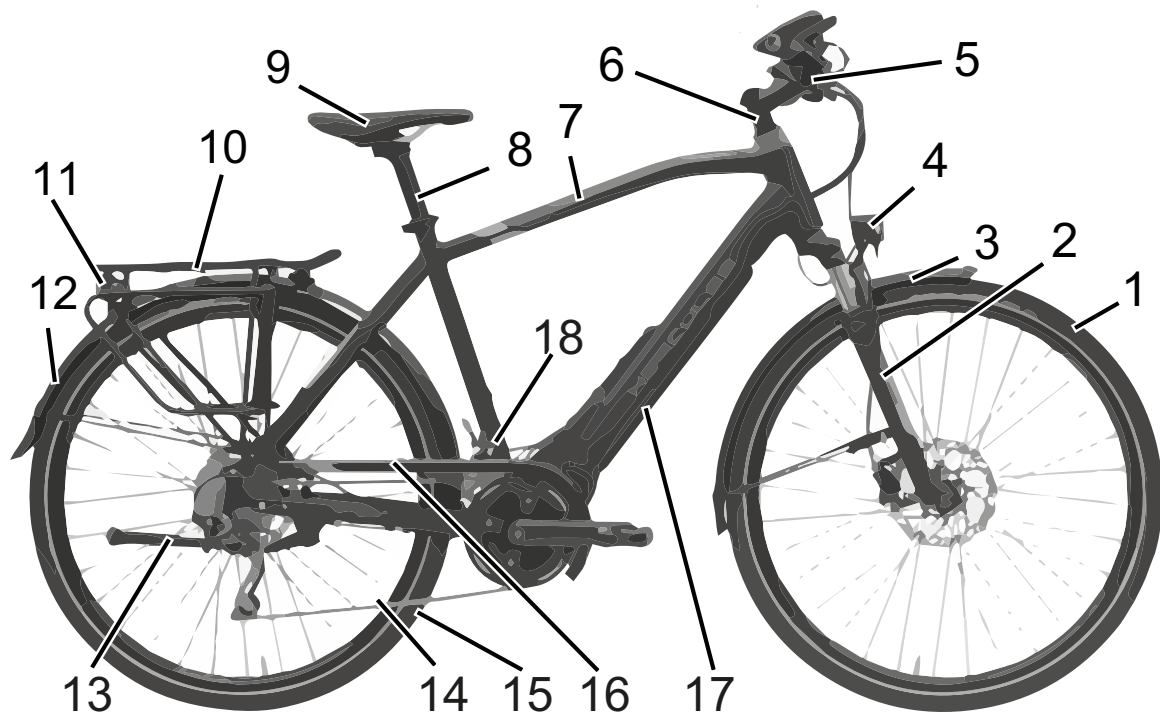


Figure 2: Pedelec on right, Pasero

- 1 *Front wheel*
- 2 *Fork*
- 3 *Front mudguard*
- 4 *Headlight*
- 5 *Handlebars*
- 6 *Stem*
- 7 *Frame*
- 8 *Seat post*
- 9 *Saddle*
- 10 *Pannier rack*
- 11 *Rear light and reflector*
- 12 *Rear mudguard*
- 13 *Kickstand*
- 14 *Chain*
- 15 *Rear wheel*
- 16 *Chain guard*
- 17 *Battery with nameplate*
- 18 *Frame number*
- 12 *Rechargeable battery*

## 3.1 Description

### 3.1.1 Wheel and suspension

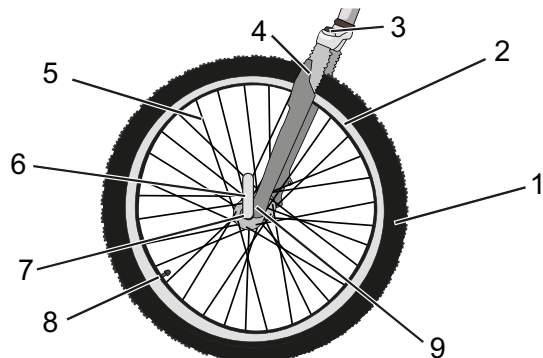


Figure 3: Components of the wheel, example of front wheel

- |   |   |
|---|---|
| 1 | Tyre                                    |
| 2 | Rim                                     |
| 3 | Suspension fork head with setting wheel |
| 4 | Shock absorber                          |
| 5 | Spoke                                   |
| 6 | Quick release                           |
| 7 | Hub                                     |
| 8 | Valve                                   |
| 9 | Fork end of the shock absorber          |

#### 3.1.1.1 Valve

Each wheel has a valve. It is used to fill the *tyre* with air. There is a valve cap on each valve. The screw-on valve cap keeps out dust and dirt.

The pedelec either has a conventional *Dunlop valve*, a *Presta valve* or a *Schrader valve*.

### 3.1.2 Suspension

Both forks and suspension forks are fitted in this model series. A suspension fork is based either on a steel spring or air suspension. Unlike a rigid fork, a suspension fork has two functions which improve floor contact and comfort: suspension and damping.

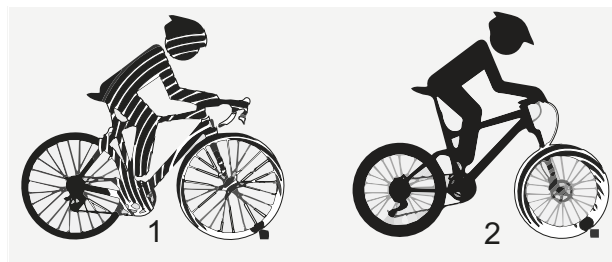


Figure 4: Pedelec without suspension (1) and with suspension (2) when riding over an obstacle

The suspension prevents an impact, such as one caused by a stone lying in the bike's path, from being channelled directly into the rider's body via the fork. The impact is absorbed by the suspension system instead. This causes the suspension fork to compress. The compression can be disabled so that a suspension fork reacts like a rigid fork. The switch to disable the fork is called a remote lockout.

After compressing, the suspension fork returns to its original position. If there is a damper, it decelerates movement, preventing the suspension system from springing back in an uncontrolled manner and stopping the fork from vibrating up and down. Dampers which dampen compressive deflection movements, i.e. a compression load, are called compression dampers or compression dashpots.

Dampers which dampen rebound deflection movements, i.e. a rebound load, are called rebound dampers or dashpots.



### 3.1.2.1 Steel suspension fork structure

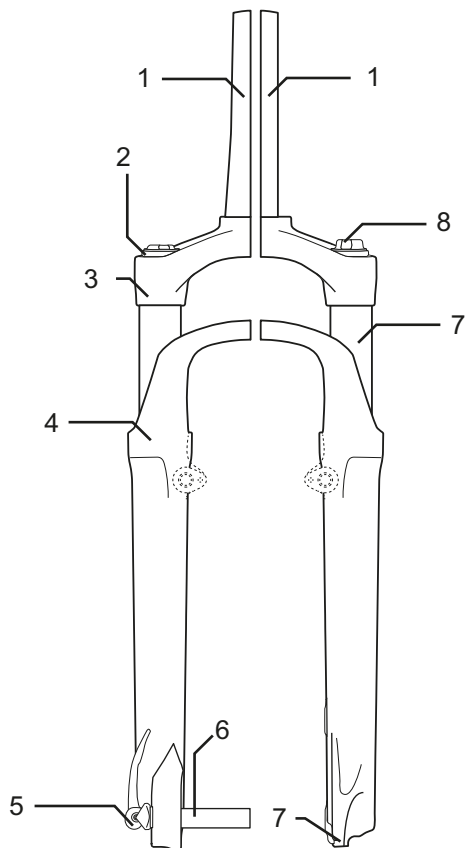


Figure 5: Example showing Suntour fork

The stem and handlebars are fastened to the fork steerer (1). The wheel is fastened to the quick release axle (6). Other elements: the compression setting (2), crown (3), Q-Loc (5), dust seal (6), fork end for quick release (7), stanchion (8) and spring (9)

### 3.1.2.2 Air suspension fork structure

The pedelec's fork features both air suspension and a compression damper plus a rebound damper in some cases.

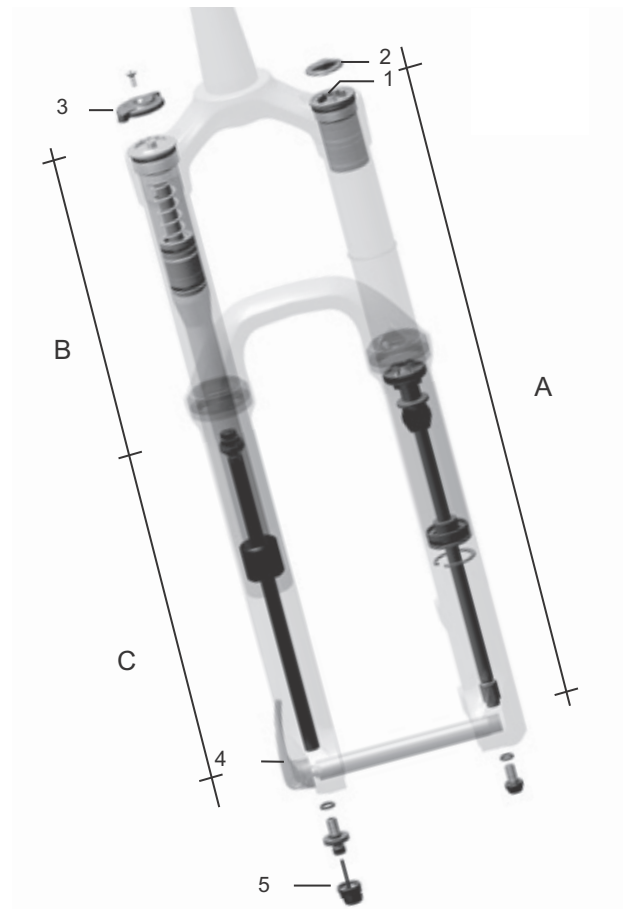


Figure 6: Example showing Yari fork

You can see the following components in the diagram: Air valve (1), valve cap (2) fork lock (3), quick release (4) and rebound damper adjuster (5) and the assembly groups: Air suspension fork (A), compression damper assembly group (B) and rebound damper assembly group (C)

### 3.1.2.3 Structure of the FOX rear frame damper

The rear frame damper features air suspension, a compression damper and a rebound damper.

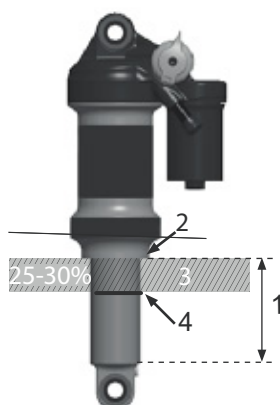


Figure 7: Example showing FOX rear frame damper

- 1 Guide rod eye
- 2 Air valve
- 3 Setting wheel
- 4 Lever
- 5 Air chamber
- 6 O-ring

### 3.1.2.4 Structure of the Suntour rear frame damper

The rear frame damper features air suspension, a compression damper and a rebound damper.

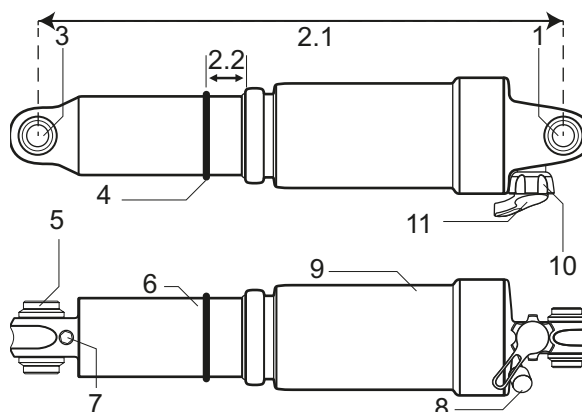


Figure 8: Example showing Suntour rear frame damper

- 1 Upper eye
- 2.1 Total damper length
- 2.2 SAG
- 3 Lower eye
- 4 O-ring
- 5 Sleeve
- 6 Damper unit
- 7 IFP (internal floating piston)
- 8 Air valve
- 9 Air chamber
- 10 Lockout lever
- 11 Rebound lever

### 3.1.3 Brake system

The pedelec's brake system comprises either a hydraulic:

- rim brake on the front and rear wheels
- disc brake on the front and rear wheels or
- a rim brake on the front and rear wheels and an additional back-pedal brake.

The mechanical brakes are used as an emergency stop system and bring the pedelec to a halt quickly and safely in the event of an emergency.



### 3.1.3.1 Rim brake

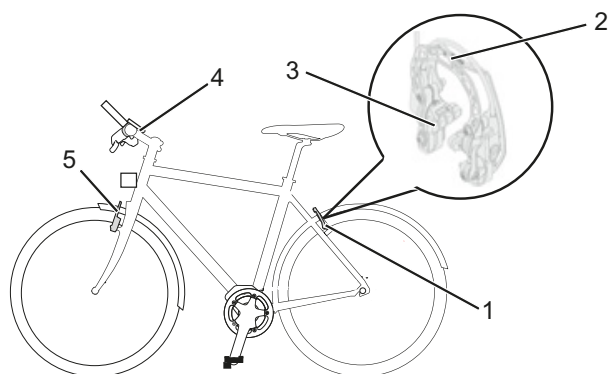


Figure 9: Rim brake components with details; Magura HS22 used as an example

- 1 Rear wheel rim brake
- 2 Brake booster
- 3 Brake lining
- 4 *Handlebars with brake lever*
- 5 Front wheel rim brake

The rim brake stops the wheel moving when the rider pulls the *brake lever*, causing two brake linings, positioned opposite one another, to be pressed onto the *rims*.

The hydraulic rim brake features a locking lever.

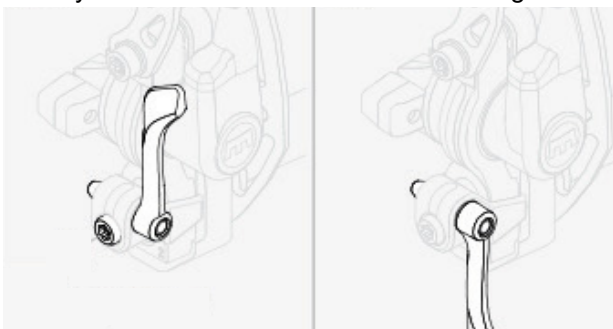


Figure 10: *Rim brake locking lever, closed (1) and open (2)*

The rim brake locking lever is not marked with any lettering. Only a specialist dealer may set the rim brake locking lever

### 3.1.3.2 Disc brake

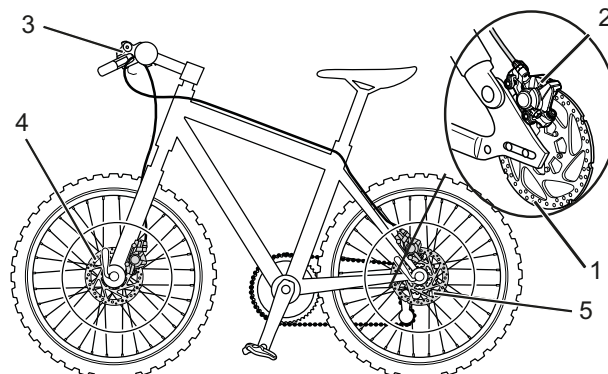


Figure 11: Pedelec brake system with a disc brake – example

- 1 Brake disc
- 2 Brake calliper with brake linings
- 3 *Handlebars with brake lever*
- 4 Front wheel brake disc
- 5 Rear wheel brake disc

On a pedelec with a disc brake, the brake disc is screwed permanently to the wheel *hub*.

The *brake lever* is pulled to increase brake pressure. The brake fluid is used to transfer pressure through the brake lines to the cylinders in the brake calliper. The braking force is boosted by a speed reduction and applied to the brake linings. These apply the brake disc mechanically. If the *brake lever* is pulled, the brake linings are pressed against the brake disc and the wheel movement is decelerated until it comes to a stop.

### 3.1.3.3 Back-pedal brake



**Figure 12: Pedelec brake system with a back-pedal brake – example**

- 1 Rear wheel rim brake
- 2 *Handlebars with brake lever*
- 3 Front wheel rim brake
- 4 *Pedal*
- 5 Back-pedal brake

The back-pedal brake stops the movement of the rear wheel when the rider pedals in the opposite direction to the direction of travel.

### 3.1.4 Electric drive system

The pedelec is driven by muscle power applied to the chain drive. The force which is applied by pedalling in the direction of travel drives the front chain wheel. The chain transmits the force onto the rear chain wheel and then onto the rear wheel.

You can ride the pedelec like a normal bike at any time, either by switching off the electric drive system or changing the level of assistance to Off. The same applies when the battery is empty.

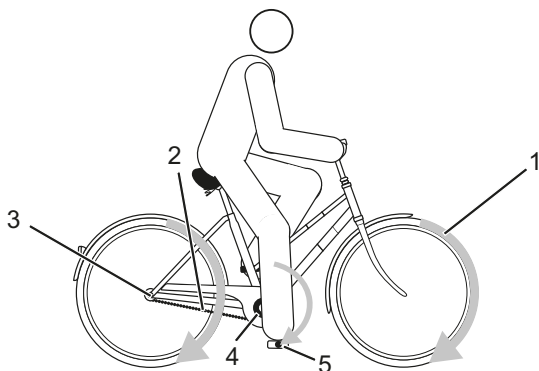


Figure 13: Diagram of drive system

- 1 Direction of travel
- 2 Chain
- 3 Rear chain wheel
- 4 Front chain wheel
- 5 Pedal

The pedelec also has an integrated electric drive system in addition to its drive system propelled by muscle power. The electric drive system is made up of 7 components:

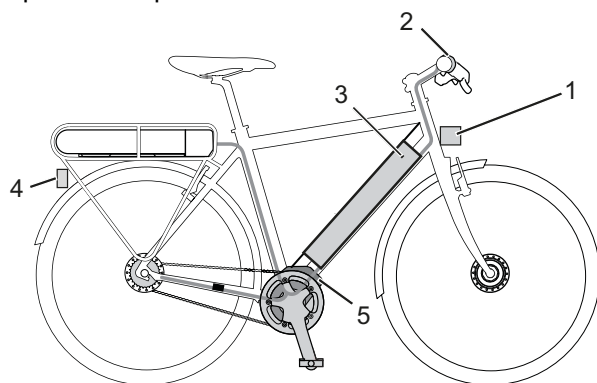


Figure 14: Diagram of electric drive system

- 1 *Headlight*
- 2 *Display*
- 3 *Operating element*
- 4 *Rechargeable battery*

- 5 Rear light
- 6 Motor
- A charger which is designed for the battery.

As soon as the required muscle power from the rider pedalling passes a certain level, the motor is activated gently and assists the pedalling motion of the rider. The motor force is determined by the set level of assistance. The assistance depends on the force applied to the pedals by the rider. Drive system assistance is therefore only activated when the rider pedals. This happens regardless of the selected level of assistance. The motor switches off automatically as soon as the rider no longer pedals, the temperature is outside the permitted range, there is an overload or the shut-off speed of 25 km/h has been reached. If the speed falls below 25 km/h, the assistance is automatically activated again.

A push assist system can be activated. The push assist continues to drive the pedelec as long as the rider presses the plus button on the handlebars. The speed can be a maximum of 6 km/h in this case.

### 3.1.5 Rechargeable battery

The lithium ion battery has an internal electronic protection circuit, which is specifically designed for the charger and the pedelec. The battery temperature is monitored at all times. The battery is protected against deep discharge, overcharging, overheating and short circuit. In the event of a hazard, a protective circuit switches the battery off automatically. The battery also switches to sleep mode for self-protection when not used for a longer period. The battery's service life can be extended if it is well maintained and, above all, stored at the correct temperatures. The battery charging capacity will decrease with age, even if the battery is maintained properly. If the operating time is severely shortened after charging, this is a sign that battery has reached the end of its useful life.

Transportation temperature	5 °C - 25 °C
Ideal transportation temperature	10 °C - 15 °C
Storage temperature	5 °C - 25 °C
Ideal storage temperature	10 °C - 15 °C
Charging ambient temperature	10 °C - 30 °C

Table 7: Rechargeable battery technical data

The pedelec has two types of integrated battery: either an Evo 550 battery or a SuperCore battery.

### 3.1.5.1 Evo 550 battery

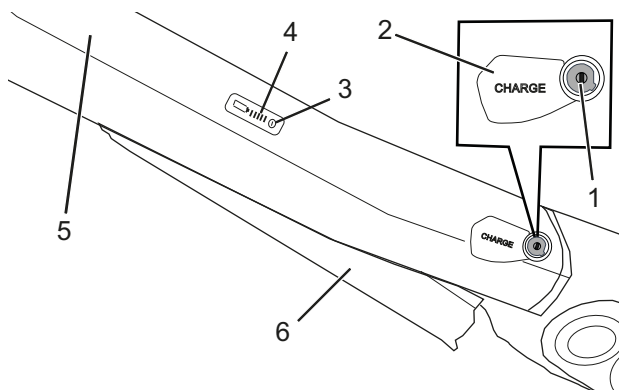


Figure 15: Evo 550 battery details

- 1 Battery lock
- 2 Port for charger plug
- 3 On/off switch
- 4 Battery level indicator
- 5 Top of down tube
- 6 Battery, extended out

#### Battery level indicator

The five green LEDs on the battery level indicator show the charge level when the battery is switched on. Each LED represents 20% of the battery level. The charge level for the switched-on battery is also shown on the *display screen*.

If the battery level falls below 5%, all the LEDs on the operating status and battery level indicator will go out. However, the battery level is still shown on the *display screen*.

### 3.1.6 SuperCore rechargeable battery

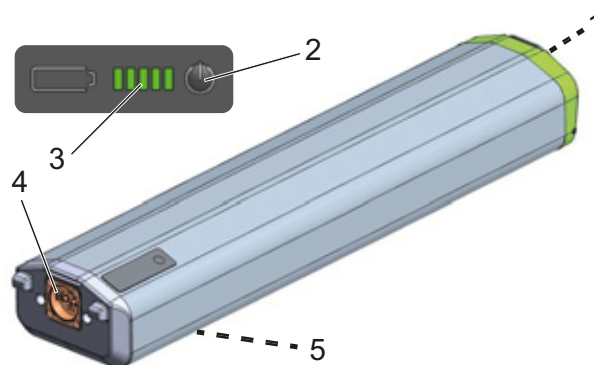


Figure 16: Details of SuperCore rechargeable battery

- 1 Handle lever
- 2 On/off switch
- 3 Battery level indicator
- 4 Charging and discharging socket
- 5 Label on the rear

#### 3.1.6.1 Range

The range is influenced by many factors, such as:

- Level of assistance: the higher the selected level of assistance, the lower the range
- gear switching habits
- tyre type
- tyre pressure
- the age, condition and charge level of the battery
- route profile (slopes) and route quality (road surface)
- weather conditions (e.g. opposing winds, ambient temperature, etc.)
- pedelec weight and
- load

### 3.1.7 Driving light

When the driving light is activated, the *headlight* and the rear light are switched on. When the driving light is activated, the display screen changes from daytime to night mode.

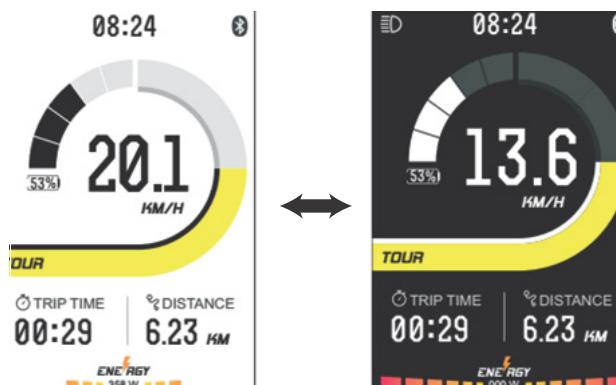


Figure 17: Daytime and night mode

### 3.1.8 Micro USB port

The display has a micro USB port on the underside. With a suitable USB cable, you can charge devices such as your mobile. The charging current is 0.5 amps. Please observe the permissible charging currents of your devices.

Charge voltage	5 V
Charging current	Max. 500 mA

Table 8: USB port technical data

### 3.1.9 Operating element

The operating element features four buttons.

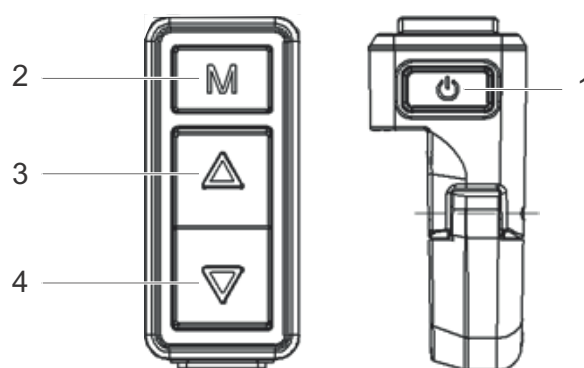


Figure 18: Operating element overview

- 1 On/off switch
- 2 Function button
- 3 Up button
- 4 Down button

### 3.2 Proper use

The pedelec must only be used in perfect, fully functional condition. National requirements may apply to the pedelec which the standard equipment may not meet. For riding on public roads, some special regulations apply in relation to the *driving light*, *reflectors* and other components.

The general laws and the regulations for the prevention of accidents and environmental protection in the respective country of use must be adhered to. All check lists and instructions for actions in these *operating instructions* met. Approved accessories can be installed by specialist staff.

Each pedelec is assigned a *pedelec type*, which determines its proper use and area of use.







City and trekking bicycles	Child's bicycles/ bicycles for young adults	Mountain bikes	Racing bicycle	Cargo bike	Folding bicycle
					
<p>City and trekking bicycles are designed for daily, comfortable use. They are suitable for riding on public roads.</p>	<p>The legal guardians of minor riders must read and understand these <i>operating instructions</i> before commissioning.</p> <p>The contents of these <i>operating instructions</i> must be communicated to the riders in an age-appropriate manner.</p> <p>The cycles for children and young adults are suitable for riding on public roads. The size of the pedelec must be checked regularly for orthopaedic reasons.</p> <p>A check must be made at least every three months to make sure that the permitted total weight is being observed.</p>	<p>Mountain bikes are designed for sporting use. The design characteristics include a short wheelbase, a sitting position with the rider inclined towards the front, and a brake requiring low actuation force.</p> <p>A mountain bike is a piece of sporting equipment. It requires an adaptation period as well as physical fitness. Use requires the appropriate training; in particular riding in bends and braking should be practised.</p> <p>The strain on the rider, in particular the hands and wrists, arms, shoulders, neck and back, is accordingly high. Inexperienced riders tend to brake excessively and lose control as a result.</p>	<p>A racing bicycle is designed for fast rides on roads and paths with a good, undamaged road surface.</p> <p>A racing bicycle is a piece of sporting equipment and not a means of transport. A racing bicycle is characterised by its lightweight structure and a design which is stripped to the minimum parts required for riding.</p> <p>The frame geometry and the layout of the operating elements are designed in such a way that the bicycle can be ridden at high speeds. The frame design requires practice to ensure the ride is able to ride slowly, apply the brakes and get on and off the bike safely.</p> <p>The sitting position is athletic. The strain on the rider, in particular the hands and wrists, arms, shoulders, neck and back, is accordingly high. The sitting position therefore requires physical fitness.</p>	<p>The cargo bike is suitable for daily transportation of loads on public roads.</p> <p>The transportation of loads requires skill and physical fitness in order to balance the additional weight. The very varied loading conditions and weight distributions require special practice and skill when braking and riding in bends.</p> <p>The length of the bicycle, its width and turning circle require a longer period of adaptation. The cargo bike requires cautious riding. You must pay attention to the traffic on public roads and the condition of the route accordingly.</p>	<p>The folding bicycle is suitable for use on public roads.</p> <p>A folding bicycle can be folded up and is thus suitable for space-saving transportation, for example on public transport or in a car.</p> <p>The folding function of the folding bicycle makes it necessary to use smaller wheels and longer brake cables and Bowden cables. Therefore, in case of an increased load, a reduction in riding stability and braking power, diminished comfort and reduced durability are to be expected.</p>

Table 9: Proper use



### 3.3 Improper use

Failure to adhere to the proper use poses a risk of personal injury and material damage. The pedelec is not suitable for the following uses:

- when the electrical drive has been manipulated
- riding with a damaged or incomplete pedelec
- riding over steps
- riding through deep water
- lending the pedelec to untrained riders
- carrying other people
- riding with excessive baggage
- riding with no hands
- riding on ice and snow
- improper servicing
- improper repair
- tough areas of use, such as professional competitions
- stunt riding or acrobatics.

City and trekking bicycles	Child's bicycles/ bicycles for young adults	Mountain bikes	Racing bicycle	Cargo bike	Folding bicycle
					
City and trekking bicycles are not sports bicycles. If used for sports, the rider can expect reduced riding stability and diminished comfort	Cycles for children and young adults are not toys.	Mountain bikes must be retrofitted with lighting, a guard and other fittings as specified by national laws and regulations before they are used on public roads.	The folding bicycle is not a sports bicycle.	A folding bicycle is not a touring bicycle or a sports bicycle.	Racing bikes must be retrofitted with lighting, a guard and other fittings as specified by national laws and regulations before they are used on public roads.

Table 10: Information on incorrect use

### 3.4 Technical data

#### 3.4.1 Pedelec

Transportation temperature	5 °C - 25 °C
Ideal transportation temperature	10 °C - 15 °C
Storage temperature	5 °C - 25 °C
Ideal storage temperature	10 °C - 15 °C
Operation temperature	5 °C - 35 °C
<i>Work environment</i> temperature	15 °C - 25 °C
Charging temperature	10 °C - 30 °C
Power output/system	250 W (0.25 kW)
Shut-off speed	25 km/h

**Table 11: Technical data for pedelec**

#### 3.4.2 Motor

Dimensions (mm)	213 x 150 x 128
Weight	3400 g
Nominal voltage	36 V DC
Protection class	IP56
Max. torque	90 Nm
Continuous power rating	250 W
Assistance up to	25 km/h
Working temperature	-10 - +50 °C

**Table 12: Motor technical data**

#### 3.4.3 Evo 550 rechargeable battery

Transportation temperature	5 °C - 25 °C
Ideal transportation temperature	10 °C - 15 °C
Storage temperature	5 °C - 25 °C
Ideal storage temperature	10 °C - 15 °C
Charging ambient temperature	10 °C - 30 °C

**Table 13: Rechargeable battery technical data**

#### 3.4.4 USB port

Charge voltage	5 V
Charging current	Max. 500 mA

**Table 14: USB port technical data**

### 3.4.5 SuperCore rechargeable battery

Nominal capacity	37/20 Ah
Energy	750 W
Maximum discharging current, continuous	25 A
Maximum charging current, continuous	5 A
Voltage	36 V
Maximum charging voltage	42 V
Weight	3.79 kg
Dimensions in mm (W x H x L)	130 x 60 x 450
Designated charger	Item no. 28555*
Transportation temperature	5 °C - 25 °C
Ideal transportation temperature	10 °C - 15 °C
Storage temperature	5 °C - 25 °C
Ideal storage temperature	10 °C - 15 °C
Charging ambient temperature	10 °C - 30 °C

**Table 15: Rechargeable battery technical data**

\*Charger: 10S | 45 V | 4.5 A | 100–240 VAC

#### 3.4.6 Display screen and control panel

<b>Power supply</b>	DC 24V/36V/48V
<b>Rated current</b>	30 ma/36 V
<b>Switch-off point in the event of residual current</b>	<1uA
<b>Display details</b>	3.5", colour, TFT, 480 x 320 pixels
<b>Communication</b>	UART (default)
<b>Protection class</b>	IP65
<b>Working temperature</b>	-20 - +60 °C
<b>Storage temperature range</b>	-30 - +80 °C

**Table 16: Operating element technical data**

### 3.4.7 USB port

Charge voltage	5 V
Charging current	Max. 500 mA

**Table 17: USB port technical data**

### 3.4.8 Emissions

A-weighted emission sound pressure level	< 70 dB(A)
Total vibration level for the hands and arms	< 2.5 m/s <sup>2</sup>
Highest effective value of weighted acceleration for the entire body	< 0.5 m/s <sup>2</sup>

**Table 18: Emissions from the pedelec\***

\*The safety requirements as per Electromagnetic Compatibility Directive 2014/30/EU have been met. The pedelec and the charger can be used in residential areas without restriction.

### 3.4.9 Tightening torque

Axle nut tightening torque	35 Nm - 40 Nm
Handlebars clamping screw maximum tightening torque*	5 Nm - 7 Nm

**Table 19: Tightening torque values**

\*if there is no other data on the component

### 3.5 Description of controls and screens

#### 3.5.1 Handlebars



Figure 19: Detailed view of pedelec from rider position, example

- 1 Rear brake lever
- 2 Bell
- 3 Headlight
- 4 Front brake lever
- 5 Gear shift
- 6 Operating element
- 7 Display
- 8 Fork lock
- 9 Gear shift

#### 3.5.2 On-screen indicators

The *display* has nine on-screen indicators:

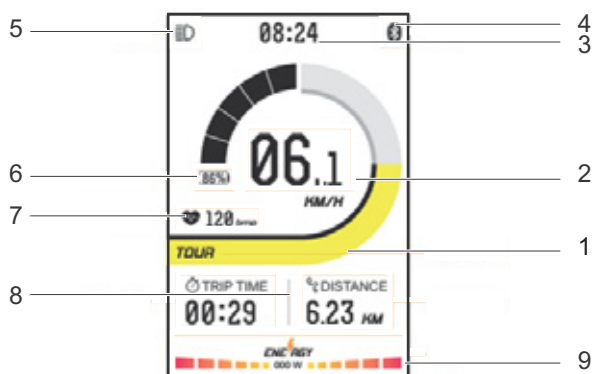


Figure 20: On-screen indicators overview

Use	
1	Level of assistance
2	Current speed with Unit of measure for speed
3	Clock
4	Bluetooth symbol
5	Driving light symbol
6	Motor power output screen
7	Pulse
8	Journey information indicator
9	Battery level indicator

Table 20: On-screen indicators overview

#### 3.5.2.1 Level of assistance

The higher the selected level for assistance, the more the drive system assists the rider when pedalling. The following levels of assistance are available:

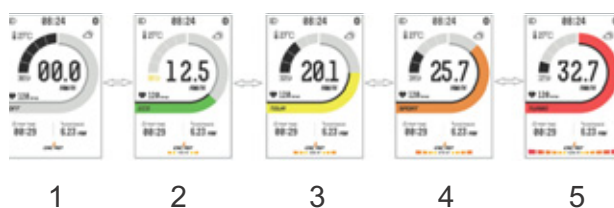


Figure 21: Level of assistance indicators

Colour	Designation
1 Grey	Off
2 Green	ECO
3 Yellow	Tour
4 Orange	Sport
5 Red	Turbo

Table 21: Overview of level of assistance

#### 3.5.2.2 Current speed

You can select whether the speed is displayed in kilometres or miles in the system settings.

#### 3.5.2.3 Journey information indicator

The function display shows three different items of information:

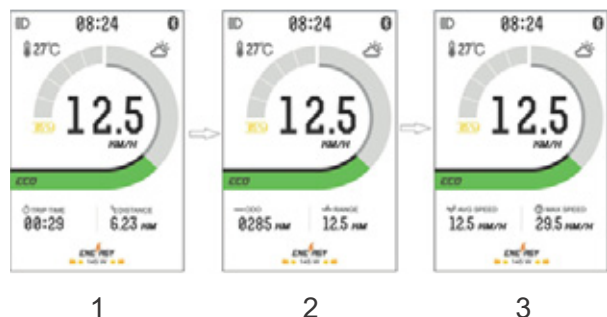


Figure 22: Journey information indicator

Colour	Designation
1 Trip time	Trip
2 Overall distance (ODO)	Range
3 Average speed (AVG Speed)	Maximum speed (Max Speed)

Table 22: Overview of level of assistance

The displayed journey information can be switched.

Screen display	Function
TRIP TIME	Time elapsed since the last reset, displayed in hh:mm
DST	Distance travelled since the last reset, displayed in kilometres or miles
ODO	Total distance travelled, displayed in kilometres or miles
RANGE	Range
AVG SPEED	Average speed since the last reset, displayed in kilometres per hour or miles per hour
MAX SPEED	Maximum speed travelled since the last reset, displayed in kilometres per hour or miles per hour

Table 23: Journey information

### 3.5.2.4 System settings and data

In order to see the system settings, the rider has to call up the system settings. The rider can change the values of the system settings.

Screen display	Function
*BLUETOOTH ON/OFF	*Switch Bluetooth function on and off
UNIT SETTING	Change units
BACKLIGHT SETTING	Set the backlight brightness
CLOCK SETTING	Set clock
PASSWORD SETTING	Change password
TIME PERIOD FOR AUTOMATIC SHUT-OFF	Set time period for automatic shut-off
*WHEEL DIAMETER	Change wheel circumference
*SPEED LIMITATION INFORMATION	Display speed limitation
*BATTERY INFORMATION	Display battery information
*SYSTEM INFORMATION	Display system information
RESET TO FACTORY SETTING	Reset to factory setting

Table 24: List of system settings

\*Not standard settings; only specialist dealer can change them

### 3.5.2.5 Battery level indicator

The battery level indicator consists of 5 segments.

If the battery level is less than 5%, the battery icon turns yellow and starts to flash. The battery level indicator starts flashing.







When charging	
0 - 5%	
5 - 39%	
40 - 59%	
60 - 70%	
70 - 90%	
90 - 100%	

Table 25: Battery level indicator on the display

### 3.5.2.6 System message

The drive system monitors itself continuously and shows a system message on the display screen in the case of a known error. The system may switch off automatically depending on the type of error.

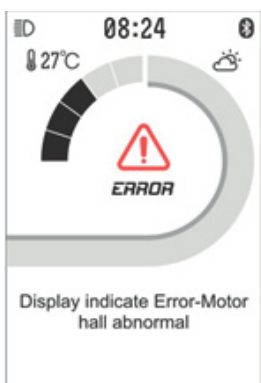


Figure 23: Example of an error message

There is a table of system messages in the Appendix.

### 3.5.3 Battery on-screen indicators

The battery indicator is on the battery:

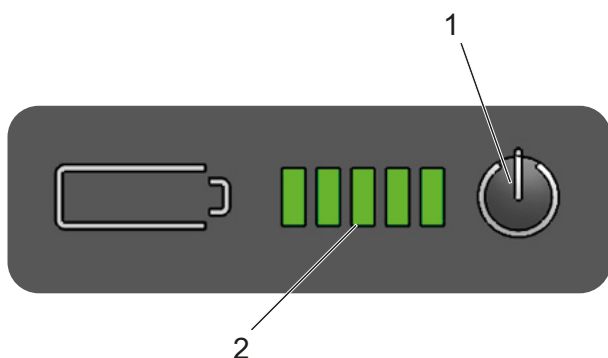


Figure 24: On-screen indicators overview

- 1 On-Off button
- 2 Battery level indicator

Symbol	Meaning
●	LED on
○	LED off
★	LED flashing

Table 26: Battery level indicator

The battery level is displayed to you when you press the on-off button.

LED 1,2,3,4,5	Battery level
● ● ● ● ●	100 - 80%
● ● ● ● ○	79 - 60%
● ● ● ○ ○	59 - 40%
● ● ○ ○ ○	39 - 20%
● ○ ○ ○ ○	19 - 10%
★ ○ ○ ○ ○	9 - 0%

Table 27: Battery level indicator

### 3.6 Environmental requirements

The pedelec is designed for outdoor use up to altitudes of 2,000 m.

You can be ride the pedelec within a temperature range between 5 °C and 35 °C. The drive system is limited in its performance outside this temperature range.

**Operation temperature** 5 °C - 35 °C

You must also keep within the following temperature ranges:

Transportation temperature 5 °C - 25 °C

Ideal transportation temperature 10 °C - 15 °C

Storage temperature	5 °C - 25 °C
Ideal storage temperature	10 °C - 15 °C
Operation temperature	5 °C - 35 °C
<i>Work environment</i> temperature	15 °C - 25 °C
Charging temperature	10 °C - 30 °C

**Table 28: Technical data for pedelec**











The nameplate contains symbols for the pedelec's area of use. Check what roads and paths you may use before you ride the pedelec for the first time.

**Table 28: Technical data for pedelec**

Area of use	City and trekking bicycles	Child's bicycles/ bicycles for young adults	Mountain bikes	Racing bicycle	Cargo bike	Folding bicycle
<b>1</b>	Suitable for tarmacked and paved roads.	Suitable for tarmacked and paved roads.	Suitable for tarmacked roads, cycle paths and easy to demanding off-road riding, sections with moderate slopes and jumps up to 61 cm.	Suitable for tarmacked and paved roads.	Suitable for tarmacked and paved roads.	Suitable for tarmacked and paved roads.
<b>2</b>	Suitable for tarmacked roads, cycle paths and firm gravel paths and roads, and longer sections with moderate slopes and jumps up to 15 cm.	Suitable for tarmacked roads, cycle paths and firm gravel paths and roads, and longer sections with moderate slopes and jumps up to 15 cm.	Suitable for tarmacked roads, cycle paths and easy to demanding off-road riding, sections with moderate slopes and jumps up to 61 cm.	Suitable for tarmacked roads, cycle paths and firm gravel paths and roads, and longer sections with moderate slopes and jumps up to 15 cm.		
<b>3</b>			Suitable for tarmacked roads, cycle paths and easy to demanding off-road riding, limited downhill use and jumps up to 122 cm.			
<b>4</b>			Suitable for tarmacked roads, cycle paths and easy to extremely difficult off-road riding, unlimited downhill use and any jumps			

**Table 29: Area of use**

The pedelec is unsuitable for the following areas of use:

Area of use	City and trekking bicycles	Child's bicycles/ bicycles for young adults	Mountain bikes	Racing bicycle	Cargo bike	Folding bicycle
 <b>1</b>	 Never drive off-road or perform jumps.	 Never drive off-road or perform jumps.		 Never drive off-road or perform jumps.	 Never drive off-road or perform jumps.	 Never drive off-road or perform jumps.
 <b>2</b>	Never drive off-road or perform jumps over 15 cm.	Never drive off-road or perform jumps over 15 cm.	Never drive off-road or perform jumps over 15 cm.	Never drive off-road or perform jumps over 15 cm.		
 <b>3</b>			Never ride downhill or perform jumps over 61 cm.			
 <b>4</b>			Never traverse extremely difficult off-road terrain or perform jumps over 122 cm.			



## 4 Transportation and storing



### 4.1 Physical transport characteristics

#### 4.1.1 Dimensions during transportation

There was no information relating to the box dimensions at the time of going to press. You'll find the information in the latest *operating instructions* on the retailer portal.

#### 4.1.2 Transport weight

There was no information relating to the box dimensions at the time of going to press. You'll find the information in the latest *operating instructions* on the retailer portal.

#### 4.1.3 Designated handles/lifting points

There was no information relating to the box dimensions at the time of going to press. You'll find the information in the latest *operating instructions* on the retailer portal.

## 4.2 Transportation



### Crash caused by unintentional activation

There is a risk of injury if the drive system is activated unintentionally.

- ▶ Remove the battery before the pedelec is transported.

### Risk of fire and explosion due to high temperatures

Excessively high temperatures will damage the battery. Batteries may self-ignite and explode.

- ▶ Never expose batteries to sustained direct sunlight.



### Oil leak if no transport securing device

The brake securing device prevents the brakes from being applied accidentally during transportation. This could cause irreparable damage to the brake system or an oil leak, which will harm the environment.

- ▶ Never pull the *brake lever* when the wheel has been dismantled.
- ▶ Always use the transport securing system when transporting dismantled wheels.

### Notice

Oil and grease may leak from the pedelec if it is lying flat.

If the shipping box with a pedelec is lying flat or standing on one end, it does not provide the *frame* and wheels with adequate protection against damage.

- ▶ Transport the pedelec in an upright position only.

Bicycle rack systems which use the *handlebars* or *frame* to hold the pedelec in an upside-down position exert inadmissible forces on its components during transportation. This can cause the supporting parts to break.

- ▶ Never use bicycle rack systems which use the pedelec's *handlebars* or *frame* to hold it in an upside-down position.
- ▶ Take into account the weight of the ready-to-use pedelec when transporting it.
- ▶ Remove the *display screen* and the batteries before transporting the pedelec.
- ▶ Protect the electrical components and connections on the pedelec from the weather conditions with suitable protective covers.
- ▶ Remove accessories such as drinking bottles before transporting the pedelec.
- ▶ You must use a suitable bicycle rack system when transporting by car.

### Notice

The specialist dealer will advise you on how to select a suitable rack system properly and how to use it safely.

- ▶ If you ship the pedelec, we recommend that you have it partially dismantled and packaged properly by the specialist dealer.
- ▶ Transport the pedelec in a dry, clean position where it is protected from direct sunlight.

#### 4.2.1 Transporting the battery

Batteries are subject to hazardous goods regulations. Undamaged batteries may be transported by private persons in road traffic.

Commercial transport requires compliance with regulations concerning packaging, labelling and the transportation of hazardous goods. Open contacts must be covered and the battery securely packaged.

#### 4.2.2 Shipping the battery

The battery is considered a hazardous good and only trained persons may pack and ship a battery. Contact your specialist dealer regarding any battery shipment.

#### 4.2.3 Using the brake transport securing system

- ▶ Insert the transport securing devices between the brake linings.
- ⇒ The transport securing device is squeezed between the two linings.

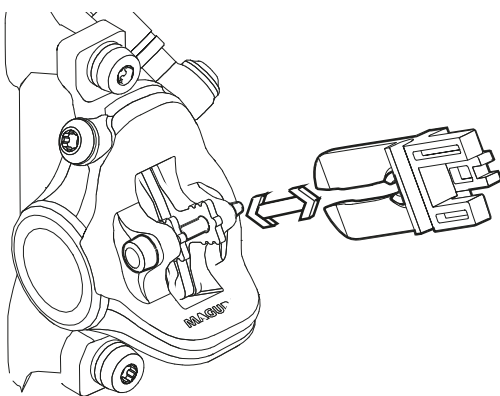


Figure 25: Fastening the transport securing device

## 4.3 Storing

### CAUTION

#### Risk of fire and explosion due to high temperatures

Temperatures over 60 °C can also cause liquid to leak from the battery and the battery will become damaged. Batteries may self-ignite and explode.

- ▶ Protect batteries against heat.
- ▶ Never store in proximity to hot or flammable objects.
- ▶ Never expose batteries to continuous direct sunlight and never store near heaters.

### Notice

Oil and grease may leak from the pedelec if it is lying flat.

If the shipping box with a pedelec is lying flat or standing on one end, it does not provide the *frame* and wheels with adequate protection against damage.

- ▶ Store the pedelec in an upright position only.
- ✓ If the pedelec features a hydraulic seat post, fix only the lower seat post or the frame into a fitting stand to prevent damage to the upper seat post and the seat post lever.
- ✓ Never place a pedelec with a hydraulic seat post upside down on the floor; otherwise you, will damage the seat post lever.
- ✓ Store the pedelec, battery and charger in a dry, clean location.

Storage temperature	5 °C - 25 °C
Optimum pedelec storage temperature	10 °C - 15 °C
Optimum battery storage temperature	22 °C - 26 °C

Table 30: Storage temperature for batteries, the pedelec and charger

### 4.3.1 Break in operation

#### Notice

The battery discharges when not in use. This can cause irreparable damage to the battery.

- ▶ The battery must be recharged every 3 months.

The battery may become damaged if it is connected permanently to the charger.

- ▶ Never connect the battery to the charger permanently.

The display battery discharges when it is not in use. This can cause it to be irreparably damaged.

- ▶ Recharge the display battery for at least 1 hour every 3 months.

If the pedelec is to be removed from service for longer than four weeks, for the winter, for example, you need to prepare it for a break in operation.

#### 4.3.1.1 Preparing a break in operation

- ✓ Remove battery from the pedelec.
- ✓ Charge battery to around 50%
- ✓ The pedelec needs to be cleaned with a damp cloth and preserved with wax spray. Never wax the friction surfaces of the brake.
- ✓ Before longer periods without use, it is recommendable to have your specialist dealer carry out servicing and basic cleaning and apply preservative agent.

#### 4.3.1.2 Taking out of operation

- ▶ Store the pedelec, battery and charger in a dry, clean environment.
- ▶ Recharge the display battery for at least 1 hour every 3 months.
- ▶ Check the battery level after 8 weeks. If only one LED on the battery level indicator lights up, recharge the battery to around 60%.



## 5 Assembly

### WARNING

#### Injury to the eyes

Problems may arise if the settings are not made to components properly and you may sustain serious injuries as a result.

- ▶ Always wear safety glasses to protect your eyes during assembly.

### CAUTION

#### Crushing caused by unintentional activation

There is a risk of injury if the drive system is activated unintentionally.

- ▶ Remove the battery if it is not absolutely necessary for assembly

- ✓ Assemble the pedelec in a clean, dry environment.

The *work environment* temperature should be between 15 °C and 25 °C.

<i>Work environment</i> temperature	15 °C - 25 °C
-------------------------------------	---------------

**Table 31: *Work environment* temperature**

- ✓ If a fitting stand is used, it must be approved for a maximum weight of 30 kg.
- ✓ We recommend that you always disconnect the battery from the pedelec when using the fitting stand to reduce weight.

### 5.1 Required tools

The following tools are required to assemble the pedelec:

- Knife
- Hexagon socket spanner 2 (2.5 mm, 3, mm 4 mm, 5 mm, 6 mm and 8 mm)
- Torque wrench with working range between 5 and 40 Nm
- Twelve-point square socket T25
- Ring spanner (8 mm, 9 mm, 10 mm, 13 mm, 14 mm and 15 mm) and
- Cross, flat head and ordinary screwdriver.

## 5.2 Unpacking

### CAUTION

#### Hand injuries caused by cardboard packaging

The shipping carton is closed with metal staples. There is a risk of puncture wounds and cuts when unpacking and crushing the packaging.

- ▶ Wear suitable hand protection.
- ▶ Remove the metal staples with pliers before the shipping carton is opened.

The packaging material consists mainly of cardboard and plastic film.

- ▶ The packaging has to be disposed of in accordance with the regulations of the authorities.

### 5.2.1 Scope of delivery

The pedelec was completely assembled in the factory for test purposes and then dismantled for transportation.

The pedelec is 95–98% pre-assembled. The scope of delivery includes:

- the pre-assembled pedelec
- the front wheel
- the pedals
- quick release (optional)
- the charger
- the *operating instructions*.

The battery is supplied separately from the pedelec.

## 5.3 Commissioning

### CAUTION

#### Risk of fire and explosion due to incorrect charger

Batteries which are recharged with an unsuitable charger may become damaged internally. This may result in fire or an explosion.

- ▶ Only ever use the battery with the supplied charger.
- ▶ Mark the supplied charger clearly to prevent mix-ups – with the pedelec *frame number* or *type number*, for example.

#### Burns from hot drive

The drive cooler can become extremely hot during use. Contact may cause burns.

- ▶ Leave the drive unit to cool before cleaning.

Only trained specialist staff may perform initial commissioning since initial commissioning of the pedelec requires special tools and specialist knowledge.

Experience has shown that a pedelec which has not yet been sold is automatically handed to end users as soon as it appears ready to ride.

- ▶ For this reason, every pedelec must be prepared, so that it is fully ready for use immediately after being assembled.
- ▶ All assembly work described in the assembly report (see appendix) must be performed to ensure the pedelec is ready to ride. It describes all safety-relevant inspections, tests and maintenance tasks for the pedelec in a separate list.
- ▶ Complete an assembly report for quality assurance purposes.

## 5.3.1 Checking the battery

### WARNING

#### Risk of fire and explosion due to faulty battery

The safety electronics may fail if the battery is damaged or faulty. The residual voltage can cause a short circuit. The battery may self-ignite and explode.

- ▶ Never charge a faulty battery.

The battery must be checked before it is charged for the first time.

- ▶ Press the *On-Off button (battery)*.
- ⇒ If none of the LEDs on the operating status and battery level indicator light up, the battery may be damaged.
- ⇒ The battery can be charged if at least one of the LEDs on the operating status and battery level indicator is fully lit up, but not if all of them are.
- ▶ Once the battery has been charged, insert it into the pedelec.

## 5.3.2 Mounting the wheel in the Suntour fork

Only applies to pedelecs with this equipment

### 5.3.2.1 Mounting the wheel with screw-on axle (15 mm)

- ▶ Insert the axle completely on the drive side.

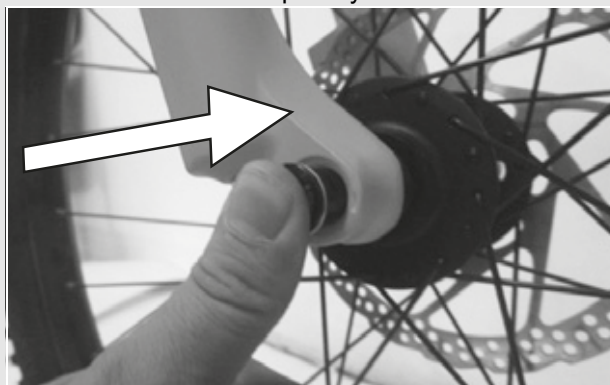


Figure 26: Fully inserting the axle

- ▶ Tighten the axle with a 5 mm hexagon socket spanner to 8–10 Nm.

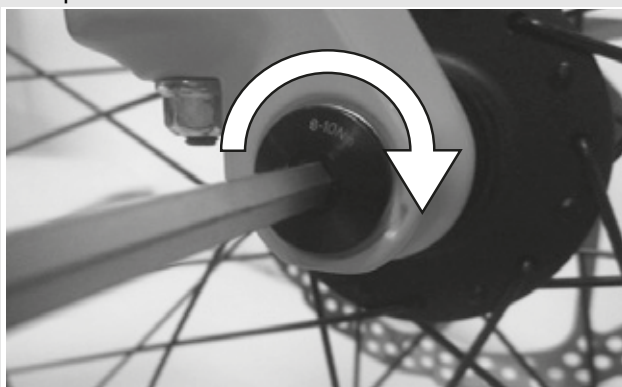


Figure 27: Tightening the axle

- ▶ Insert the securing screw on the non-drive side.

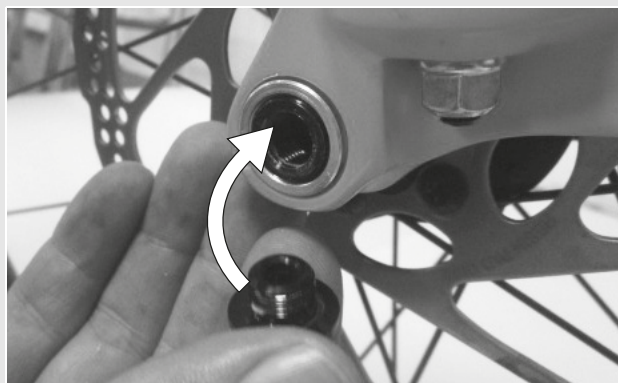


Figure 28: Pushing the quick release lever into the axle

- ▶ Tighten the securing screw with a 5 mm hexagon socket spanner to 5–6 Nm.

⇒ The lever is mounted.



Figure 29: Tightening the securing screw

### 5.3.2.2 Mounting the wheel with screw-on axle (20 mm)

- ▶ Insert the axle completely on the drive side.



Figure 30: Tightening the inserted axle

- ▶ Tighten the securing clip with a 4 mm hexagon socket spanner to 7 Nm.



Figure 31: Tightening the axle

### 5.3.2.3 Mounting the wheel with a quick release axle

#### **CAUTION**

#### **Crash caused by loose quick release axle**

A faulty or incorrectly installed quick release axle may become caught in the brake disc and block the wheel. This will cause a crash.

- ▶ Never fit a defective quick release axle.

#### **Crash caused by faulty or incorrectly installed quick release axle**

The brake disc becomes very hot during operation. Parts of the quick release axle may become damaged as a result. The quick release axle becomes loose. This will cause a crash with injuries.

- ▶ The quick release axle and the brake disc must be opposite one another.

**CAUTION**

**Crash caused by incorrectly set quick release axle**

Insufficient clamping force will cause a detrimental transmission of force. The suspension fork or the quick release axle may break. This will cause a crash with injuries.

- ▶ Never fasten a quick release axle with a tool, such as a hammer or pliers.

- ▶ Insert the axle into the hub on the drive side. Clamping version II.

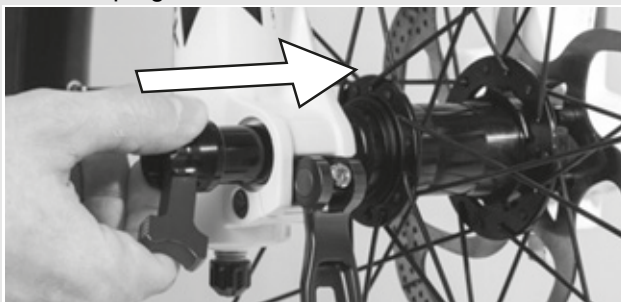


Figure 32: Pushing the axle into the hub

- ▶ Tighten the axle with the red handle.

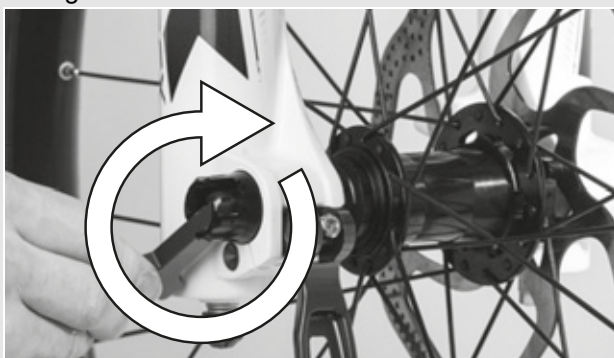


Figure 33: Tightening the axle

- ▶ Push the quick release lever into the axle.

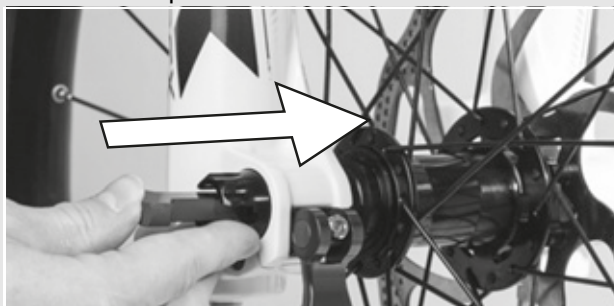


Figure 34: Pushing the quick release lever into the axle

- ▶ Reverse the quick release lever.

⇒ The lever is secured.

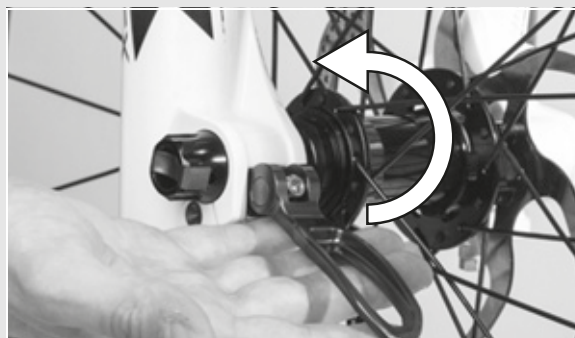


Figure 35: Securing the lever

- ▶ Check the position and clamping force of the quick release lever. The quick release lever must be flush with the lower housing. You must be able to see a slight impression on the palm of your hand when you close the quick release lever.



Figure 36: Perfect position for the clamping lever

- ▶ Use a 4 mm hexagon socket spanner to adjust the clamping lever clamping force if required. Afterwards, check the quick release lever position and clamping force.

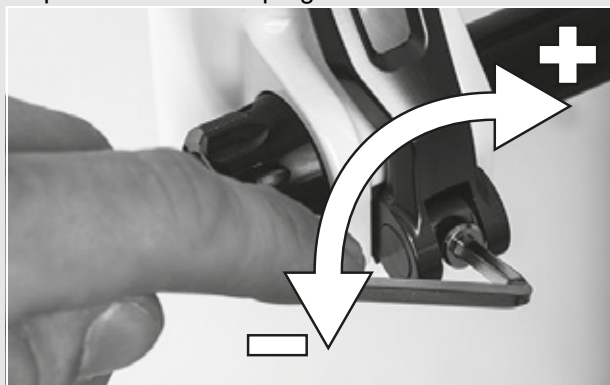


Figure 37: Adjusting the quick release clamping force

### 5.3.3 Mounting the wheel with a quick release



#### Crash caused by unfastened quick release

A faulty or incorrectly installed quick release may become caught in the brake disc and block the wheel. This will cause a crash.

- ▶ Never fit a defective quick release.

#### Crash caused by faulty or incorrectly installed quick release

The brake disc becomes very hot during operation. Parts of the quick release may become damaged as a result. The quick release comes loose. This will cause a crash with injuries.

- ▶ The front wheel quick release lever and the brake disc must be situated on opposite sides.

#### Crash caused by incorrectly set clamping force

Excessively high clamping force will damage the quick release and cause it to lose its function.

Insufficient clamping force will cause a detrimental transmission of force. The suspension fork or the quick release may break. This will cause a crash with injuries.

- ▶ Never fasten a quick release using a tool (e.g. hammer or pliers).
- ▶ Only use the clamping lever with the specified set clamping force.

- ▶ Before mounting, ensure that the quick release flange is extended. Open the lever completely.

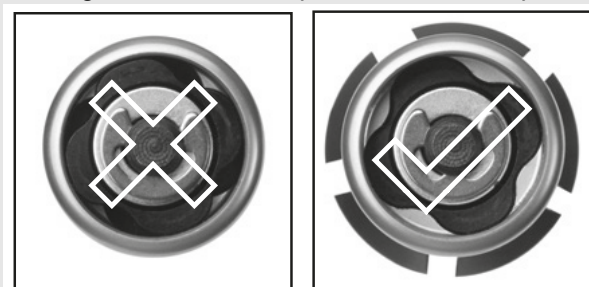


Figure 38: Open and closed flange

- ▶ Push in the quick release until you hear a clicking sound. Make sure that the flange is extended.



Figure 39: Pushing the quick release in

- ▶ Adjust the clamping with a half-open clamping lever until the flange reaches the fork end.

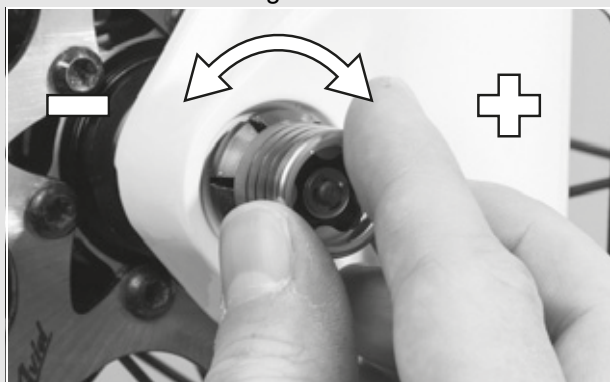


Figure 40: Adjusting the clamping

- ▶ Fully close the quick release. Check the quick release to ensure it is firmly in place and adjust on the flange if necessary.

⇒ The lever is secured.



Figure 41: Closing the quick release



### 5.3.4 Mounting the wheel in the FOX fork

Only applies to pedelecs with this equipment

#### 5.3.4.1 Wheel with quick release (15 mm)

The procedure for installing the 15 x 100 mm and 15 x 110 mm quick releases is the same.

- ▶ Place the front wheel in the fork ends of the fork. Push the axle through the fork end on the non-drive side and hub.

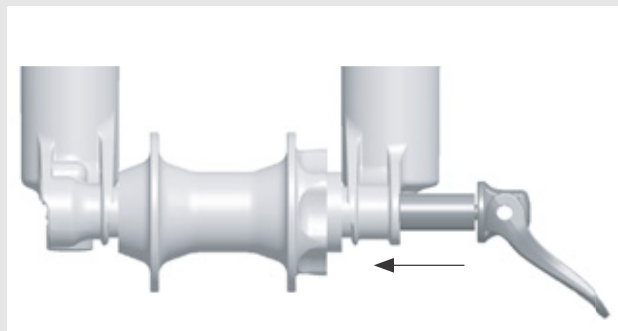


Figure 42: Pushing the quick release in

- ▶ Open the axle lever.
- ▶ Turn the axle five to six complete revolutions clockwise into the axle nut.
- ▶ Close the quick release. The lever must be tensioned to the point that it leaves a mark on your hand.
- ▶ The lever must be 1 to 20 mm ahead of the fork leg in the closed position.

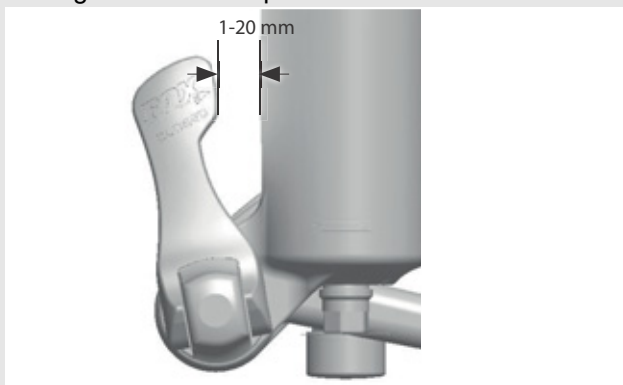


Figure 43: Spacing between lever and fork leg

- ⇒ If the lever is tensioned too little or too much when closed in the recommended position (1 to 20 mm ahead of the fork), the quick release must be adjusted.

#### 5.3.4.2 Adjusting the FOX quick release

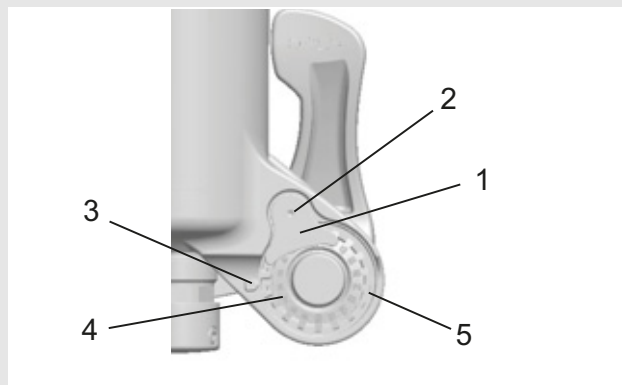


Figure 44: Structure of quick release from rear with (1) axle nut lock, (2) axle nut securing screw, (3) directional arrow, (4) axle setting value and (5) axle nut

- ▶ Record the axle setting value (4) indicated by the directional arrow (3).
- ▶ Loosen the axle nut securing screw (2) with a 2.5 mm hex key by approx. four revolutions, but do not remove the screw completely.
- ▶ Turn the quick release lever to the open position and loosen the axle by approx. four revolutions.
- ▶ Press the axle inward from the side of the open lever. This pushes out the axle nut securing screw so that you can turn it out of the way.
- ▶ Push the axle further forward and turn the axle nut clockwise to increase the lever tension or anti-clockwise to reduce the lever tension.
- ▶ Reinsert the axle nut lock and tighten the screw to 0.9 Nm (8 in-lb).
- ▶ Repeat the steps for installing the axle to check proper installation and correct adjustment.

### 5.3.4.3 Mounting the wheel with Kabolt axles

The procedure for installing the 15 x 100 mm and 15 x 110 mm Kabolt axles is the same.

- ▶ Place the front wheel in the fork ends of the fork. Push the Kabolt axle through the fork end on the non-drive side and hub.

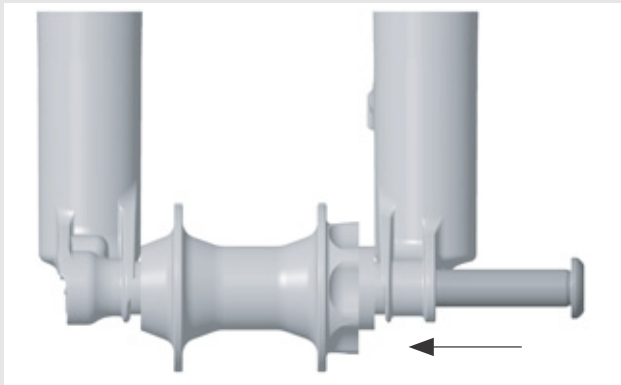


Figure 45: Pushing the Kabolt axle in

- ▶ Tighten the Kabolt axle screw to 17 Nm (150 in-lb) with a 6 mm hex key.

### 5.3.4.4 Checking the stem and handlebars

#### Checking connections

- ▶ Stand in front of the pedelec to check whether the handlebars, stem and fork steerer are firmly attached to one another. Clamp the front wheel between your legs. Grasp the handlebar grips. Try to twist the handlebars towards the front wheel.

⇒ The stem must not move or twist.

#### Firm hold

- ▶ Place your entire body weight on the handlebars with the quick release lever closed to check that the stem is firmly in place.
- ⇒ The handlebars shaft must not move downwards in the fork steerer.
- ▶ If the handlebars shaft should move in the fork steerer, increase the quick release lever tensioning. To do so, turn the knurled nut slightly in a clockwise direction with the quick release lever open.
- ▶ Close the lever and check the stem is firmly in position.

### Checking the headset backlash

- ▶ To check the handlebar headset backlash, close the quick release lever on the stem. Place the fingers of one hand on the upper headset cup, pull the front wheel brake with the other hand and try to push the pedelec backwards and forwards.
- ▶ The headset cup halves must not move towards one another while you are doing this. Note that there may be noticeable backlash due to worn-out bearing bushes or brake lining backlash in suspension forks and disc brakes.
- ▶ If there is headset backlash in the steering headset, you must adjust it as soon as possible; otherwise, the headset will become damaged. You must make the adjustment as described in the stem manual.

### 5.3.5 Pedelec sale

- ▶ Complete the data sheet on the *operating instructions* envelope.
- ▶ Adjust the pedelec to the rider.
- ▶ Set the *stand* and the *shifter*, and show the purchaser the settings.
- ▶ Instruct the operator or rider on how to use all the pedelec's functions.

## 6 Operation

### 6.1 Risks and hazards



#### WARNING

#### Injuries and death caused by other road users

Other road users, trucks, cars or pedestrians often underestimate the speed of pedelecs. Likewise, other road users frequently do not see pedelec riders. This may cause a crash with serious injuries or even death.

- ▶ Wear a cycling helmet and high-visibility, reflective clothing.
- ▶ Always take a defensive approach to riding.
- ▶ Avoid the blind spots of vehicles turning off and reduce your speed as a precaution when other road users turn right.

#### Injuries and death caused by riding incorrectly

A pedelec is not a bicycle. Incorrect riding and underestimated speeds soon result in hazardous situations. This may cause a fall with serious injuries or even death.

- ▶ If you haven't ridden on a pedelec for some time, get accustomed to the speed before you ride at speeds over 12 km/h. Increase the level of assistance on your pedelec gradually.
- ▶ Practice hard braking on a regular basis.
- ▶ Take and complete a riding safety course.



#### CAUTION

#### Crash caused by loose clothing

Shoe laces, scarves and other loose items may become entangled in the spokes on the *wheels* and on the *chain drive*. This may cause a crash with injuries.

- ▶ Wear sturdy footwear and close-fitting clothing.



#### CAUTION

#### Risk of fire and burning due to hot motor

The motor housing becomes hot when riding. Touching it may cause burns to the skin or other objects.

- ▶ Never touch the motor housing directly after riding.
- ▶ Never place the pedelec on a flammable surface, such as grass or wood, directly after use.

#### Crash caused by soiling

Heavy soiling can impair pedelec functions, such as braking. This may cause a crash with injuries.

- ▶ Remove coarse soiling before riding.

#### Crash caused by poor road conditions

Loose objects, such as branches and twigs, may become caught in the wheels and cause a crash with injuries.

- ▶ Be aware of the road conditions.

Ride slowly and brake in good time.

#### Notice

Heat or direct sunlight can cause the *tyre pressure* to increase above the permitted maximum pressure. This can destroy the *tyres*.

- ▶ Never park the pedelec in the sun.
- ▶ On hot days, regularly check the *tyre pressure* and adjust it as necessary.

When riding downhill, high speeds may be reached.

The pedelec is only designed to exceed a speed of 25 km/h for short periods. The *tyres* in particular can fail if exposed to a continuous load.

- ▶ Decelerate the pedelec with the brakes if you reach speeds greater than 25 km/h.

### Notice

Moisture penetrating at low temperatures may impair individual pedelec functions due to the open structural design.

- ▶ Always keep the pedelec dry and free from frost.
- ▶ If the pedelec is to be used at temperatures below 3 °C, the specialist dealer must carry out an inspection and prepare the pedelec for winter usage first.

If you leave a key inserted when riding or transporting the pedelec, it may break off or the locking system may open accidentally.

- ▶ Remove the key from the battery lock immediately after use.
- ▶ We recommend that you attach the key to a key ring.

Off-road riding subjects the joints in the arms to severe strain.

- ▶ Take a break from riding every 30 to 90 minutes, depending on the road surface conditions

#### 6.1.1 Ambient conditions

The pedelec is designed for outdoor use.

You can be ride the pedelec within a temperature range between 5 °C and 35 °C. The drive system is limited in its performance outside this temperature range.

<b>Operation temperature</b>	5 °C - 35 °C
------------------------------	--------------

You must also keep within the following temperature ranges:

Transportation temperature	5 °C - 25 °C
Ideal transportation temperature	10 °C - 15 °C
Storage temperature	5 °C - 25 °C
Ideal storage temperature	10 °C - 15 °C
Operation temperature	5 °C - 35 °C
<i>Work environment</i> temperature	15 °C - 25 °C
Charging temperature	10 °C - 30 °C

**Table 32: Technical data for pedelec**

#### 6.1.2 Personal protective equipment

We recommend that you wear a suitable cycling helmet. We also recommend that you wear sturdy footwear and typical, close-fitting, reflective clothing for bicycles.

## 6.2 Error messages

### 6.2.1 Error message display

The drive system monitors itself continuously and displays a number as an error message if a known error is detected. The system may switch off automatically depending on the type of error.

Code	Description	Method of resolution
10	The battery voltage is too low.	► Charge the battery with the charger.
11	The battery voltage is too high.	► Switch off the system completely using the On-Off button on the battery and then switch it on again. ► Contact your specialist dealer if the problem persists.
12	The battery is almost or completely discharged.	► Charge the battery with the charger.
20	Electrical measurements are incorrect.	► Switch off the system completely using the On-Off button on the battery and then switch it on again. ► Contact your specialist dealer if the problem persists.
21		
23	The temperature sensor is faulty.	
24	The internal voltage is outside the working range.	► Charge the battery with the charger.
25	Error in the motor current measurement.	► Switch off the system completely using the On-Off button on the battery and then switch it on again. ► Contact your specialist dealer if the problem persists.
26	A software reset was carried out.	
30	Error in the push assist system.	► Contact your specialist dealer if the problem persists.
40	Overcurrent detected in the motor.	► Reduce the motor load by pedalling less or reducing the level of assistance
41	Overcurrent detected in the motor.	► Reduce the motor load by pedalling less.
42	Fault in the motor rotation.	► Switch off the system completely using the On-Off button on the battery and then switch it on again. ► Contact your specialist dealer if the problem persists.
43	Short circuit in motor.	

Table 33: List of error messages

Code	Description	Method of resolution
44	Motor is overheating.	► Reduce the motor load by pedalling less or reducing the level of assistance.
45	The software has corrected an error during motor rotation.	► Switch off the system completely using the On-Off button on the battery and then switch it on again. ► Contact your specialist dealer if the problem persists.
46	No motor movement detected, although a current >2A was measured.	
60	Interruption in data exchange on the CAN-BUS.	► Check the cables and connectors of all components of the drive system.
70	Pedal force not within the valid range.	► Switch off the system completely using the On-Off button on the battery and then switch it on again. ► Contact your specialist dealer if the problem persists.
71	No pedal rotation detected.	
72	No pedal force detected.	
73	Connection to the pedal force sensor malfunctioning.	
80	Incorrect motor parameter.	► Switch off the system completely using the On-Off button on the battery and then switch it on again. ► Contact your specialist dealer if the problem persists.
81	Speed not detected.	► Make sure that the spoke magnet is correctly positioned opposite the speed sensor.
82	The program was manipulated.	► Switch off the system completely using the On-Off button on the battery and then switch it on again. ► Contact your specialist dealer if the problem persists.
83	Error in program process.	
84	Incorrect motor parameter.	

Table 33: List of error messages

## 6.2.2 Battery error message

Code	Description	Method of resolution
All LEDs flashing	Battery defective.	▶ Contact your specialist dealer.
First LED flashing	Battery empty.	▶ Charging the battery
No LEDs light up	Mechanical defect.	▶ Contact your specialist dealer.

## 6.3 Before the first ride



### Crash caused by incorrectly adjusted torques

If a screw is fastened too tightly, it may break. If a screw is not fastened enough, it may loosen. This will cause a crash with injuries.

- ▶ Always observe the indicated torques on the screw or in the *operating instructions*.

Only a correctly adjusted pedelec will guarantee you the desired ride comfort and health-promoting activity. Therefore adjust the *saddle*, the *handlebars* and the *suspension* to your body and your preferred riding style before the first ride.

### 6.3.1 Adjusting the saddle

#### 6.3.1.1 Adjusting the saddle tilt

The saddle tilt must be adjusted to the seat height, the saddle and handlebar position, and the saddle shape to ensure an optimum fit. The seating position can be optimised in this way if needed. First, readjust the saddle after finding the handlebar position you prefer.

- ⇒ Place the saddle tilt in the horizontal position to adjust the pedelec to your needs for initial use.

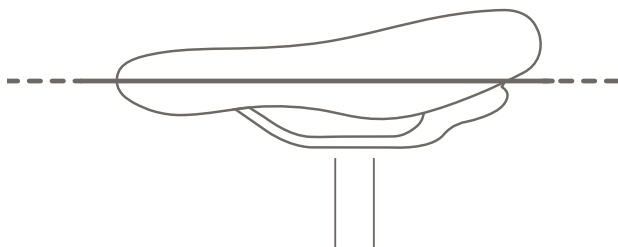


Figure 46: Horizontal saddle tilt

### 6.3.2 Determining the seat height

- ✓ To determine the seat height safely, either push the pedelec near to a wall, so that you can lean on the wall to support yourself or ask another person to hold the pedelec for you.
- ▶ Climb onto the pedelec.

- ▶ Place your heel on the pedal and extend your leg, so that the pedal is at the lowest crank rotation point.

- ⇒ The rider sits straight on the saddle if the seat is at an optimum height. If this is not the case, you can adjust the length of the seat post to your needs.

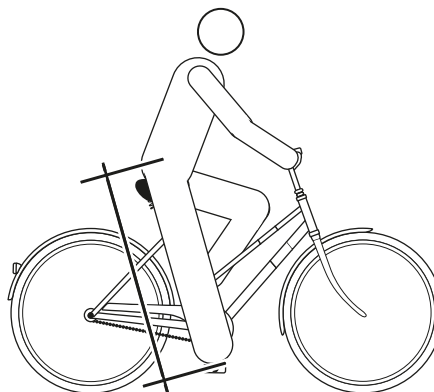


Figure 47: Optimal saddle height

#### 6.3.2.1 Adjusting the seat height with quick release

- ▶ Open the quick release on the seat post to change the seat height. To do so, push the clamping lever away from the seat post.

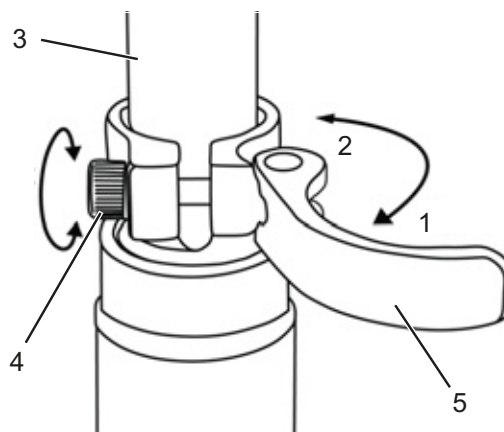


Figure 48: Seat post quick release (3)

The seat post quick release with clamping lever (5) and setting bolt (4) in the open position (1) and in the direction of the closed position (2)

- ▶ Set the seat post at the required height.



### Crash caused by an excessively high seat post setting

A *seat post* which is set too high will cause the *seat post* or the *frame* to break. This will cause a crash with injuries.

- ▶ Do not pull the seat post out of the frame beyond the minimum insertion depth marking.

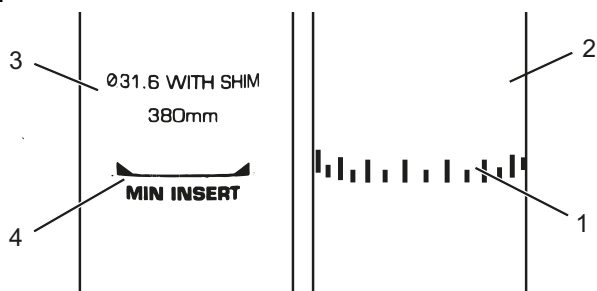


Figure 49: Detailed view of the seat post – examples of the minimum insertion depth marking

- ▶ To close it, push the *seat post clamping lever* as far as it will go into the *seat post*.
- ▶ Check the *clamping force of quick releases*.

### 6.3.2.2 Height-adjustable seat post

Only applies to pedelecs with this equipment

- ✓ When using your seat post for the first time, you must give it a firm push downwards to set it in motion. This is due to the natural tendency of the seal to repel oil from the seal surface. You only need to do this before the first use or after a longer period of non-use. Once you have displaced the post through its deflection, the oil spreads on the seal and the post begins to function normally.

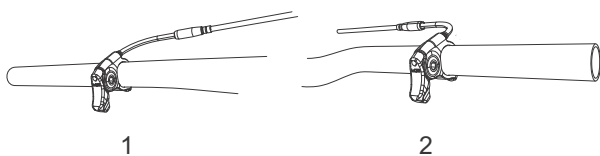


Figure 50: The seat post activation lever can be mounted either on the left (1) or the right (2) side of the handlebars

### Lowering the saddle

- ✓ To lower the saddle, press your hand down on the saddle or sit on the saddle. Press the seat post activation lever and hold it down.
- ▶ Release the lever once you have reached the required height.

### Raising the saddle

- ▶ Pull the seat post activation level.
- ▶ Remove any pressure on the saddle and release the lever once you have reached the required height.

### 6.3.2.3 Adjusting the seat position

The saddle can be shifted on the saddle frame. The right horizontal position ensures an optimal leverage position for legs. This prevents knee pain and painful incorrect pelvis positions. If you have displaced the saddle more than 10 mm, you then need to adjust the saddle height again since both settings affect one another.

- ✓ To adjust the seat position safely, either push the pedelec near to a wall, so that you can lean on the wall to support yourself or ask another person to hold the pedelec for you.
- ▶ Climb onto the pedelec.
- ▶ Place the pedals into the vertical position (3 o'clock position) with your feet.
- ⇒ The rider is sitting in the optimal sitting position if the knee cap perpendicular line runs through the pedal axle. If the perpendicular line crosses behind the pedal, bring the saddle forward. If the perpendicular line crosses in front of the pedal, bring the saddle back. Move the saddle



within its permitted displacement range only (marked on the saddle stay).

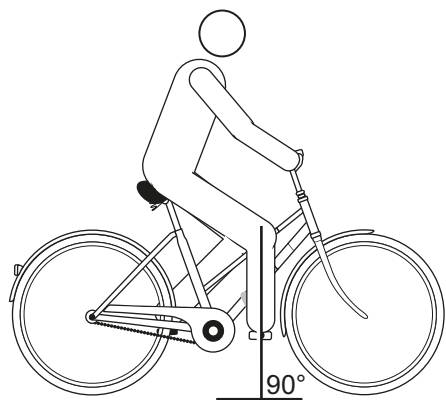


Figure 51: Knee cap perpendicular line



- ✓ The handlebars must only be adjusted while the pedelec is stationary.
- ▶ Unfasten and adjust the designated screw connections, and clamp them with the maximum tightening torque for the clamping screws of the handlebars.

### 6.3.3 Adjusting the handlebars

#### 6.3.3.1 Adjusting the stem

#### ⚠ CAUTION

##### Crash caused by loose stem

Incorrectly fastened screws may come loose due to impact. The stem may no longer be firmly fixed in its position as a result. This will cause a crash with injuries.

- ▶ Check the handlebars and the quick release system are firmly in position after the first two hours of riding.

#### 6.3.3.2 Adjusting the height of the handlebars

#### ⚠ CAUTION

##### Crash caused by incorrectly set clamping force

Excessively high clamping force will damage the quick release and cause it to lose its function. Insufficient clamping force will cause a detrimental transmission of force. This can cause components to break. This will cause a crash with injuries.

- ▶ Never fasten a quick release using a tool (e.g. hammer or pliers).
  - ▶ Only use the clamping lever with the specified set clamping force.
- 
- ▶ Open the clamping lever.
  - ▶ Pull the locking lever on the stem up, and simultaneously pivot the handlebars into the desired position.
- ⇒ You feel the locking lever click into place.
- ▶ Pull out the handlebars to the required height.
  - ▶ Lock the quick release.

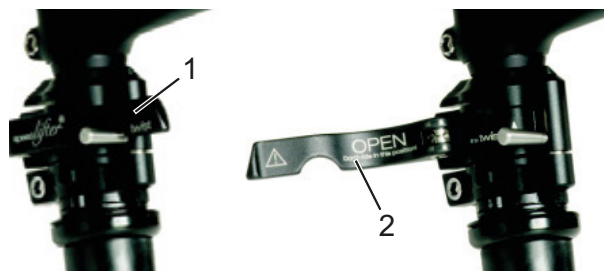


Figure 52: Open (2) and closed (1) clamping lever on the stem; by.schulz speedlifter used as an example

### 6.3.3.3 Turning the handlebars to the side

Only applies to pedelecs with this equipment

#### CAUTION

#### Crash caused by incorrectly set clamping force

Excessively high clamping force will damage the quick release and cause it to lose its function.

Insufficient clamping force will cause a detrimental transmission of force. This will cause a crash with injuries.

- ▶ Never fasten a quick release using a tool (e.g. hammer or pliers).
  - ▶ Only use the clamping lever with the specified set clamping force.
- 
- ▶ Open the clamping lever.
  - ▶ Pull the locking lever on the stem up, and simultaneously pivot the handlebars into the desired position.
- ⇒ You feel the locking lever click into place.
- ▶ Pull out the handlebars to the required height.
  - ▶ Lock the quick release.

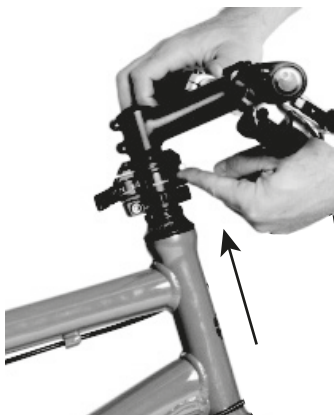


Figure 53: Pushing locking lever upwards – by.schulz speedlifter used as an example

### 6.3.3.4 Checking the clamping force in quick releases

- ▶ Open and close the quick releases on the stem or the seat post.
- ⇒ The clamping force is sufficient if the clamping lever can be moved easily from the open final position into the middle and has to be pressed with the fingers or base of the thumb from the middle point onwards.

### 6.3.3.5 Adjusting the quick release clamping force

- ▶ If the *clamping lever on the handlebars* cannot be moved into its final position, screw out the *knurled nut*.
- ▶ Tighten the *knurled nut* on the seat post if the *clamping lever's* clamping force is not sufficient.
- ▶ If you are unable to set the clamping force, the specialist dealer will need to check the quick release.

## 6.3.4 Adjusting the brake lever

### 6.3.4.1 Adjusting the pressure point on a Magura brake lever

#### WARNING

#### Brake failure due to incorrect setting

If the pressure point is set with brakes where the brake linings and brake disc have reached their wear limit, the brakes may fail and cause an accident with injury.

Before you set the pressure point, ensure that the brake linings and brake disc have not reached their wear limit.

The pressure point setting is adjusted using the twist knob.

- ▶ Turn the twist knob towards the plus (+) symbol.
- ⇒ The *brake lever* moves closer to the handlebar grip. Re-adjust the grip distance as necessary.
- ⇒ The lever pressure point activates sooner.

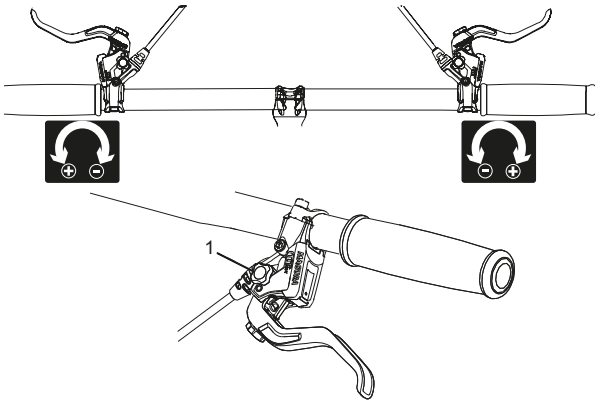


Figure 54: Using the twist knob (1) to adjust the pressure point

### 6.3.4.2 Adjusting the grip distance

**⚠ WARNING**

**Crash caused by incorrectly set grip distance**

If brake cylinders are set incorrectly or installed wrongly, the braking power may be lost at any time. This may cause a crash with injuries.

- ▶ Once the grip distance has been set, check the position of the brake cylinder and adjust it as necessary.

Never correct the brake cylinder position without special tools. Have a specialist dealer correct it.

- ▶ The brake lever grip distance can be adjusted to ensure that it can be reached more easily. Contact your specialist dealer if the brake handle is too far from the handlebars or is hard to use.

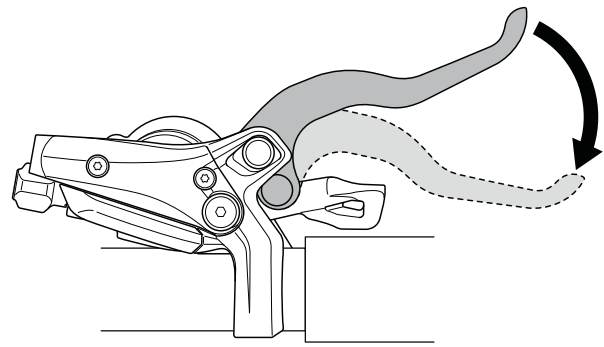


Figure 55: Brake lever grip distance

### 6.3.4.3 Adjusting the grip distance on a Magura brake lever

Only applies to pedelecs with this equipment

Use a T25 TORX® wrench to turn the setting screw to adjust the grip distance.

- ▶ Turn the setting screw in the minus (-) direction.
  - ⇒ The brake lever moves closer to the handlebar grip.
- ▶ Turn the setting screw in the plus (+) direction.
  - ⇒ The brake lever moves away from the handlebar grip.

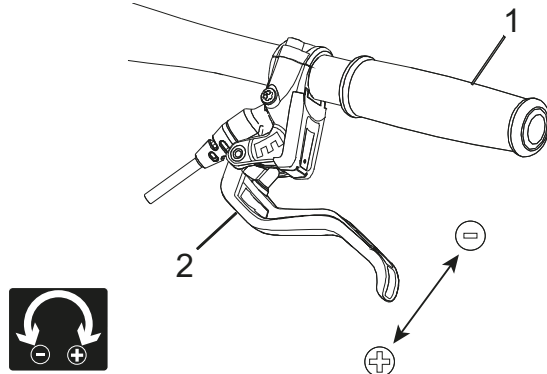


Figure 56: Using the setting screw (2) to adjust the distance from the brake lever to the handlebar grip (1)

### 6.3.5 Adjusting the suspension of the Suntour fork

#### Only applies to pedelecs with this equipment

The following Suntour forks can be installed in this series of models:

Aion-35 Boost	Air suspension fork
NCX	Air suspension fork
NEX	Steel suspension fork
XCM-ATB	Steel suspension fork
XCM	Steel suspension fork
XCR32	Air suspension fork
XCR34	Air suspension fork

Table 34: Overview of Suntour forks



#### Crash caused by incorrectly set suspension

If the suspension is adjusted incorrectly, the fork may become damaged, so that problems may occur when steering. This will cause a crash with injuries.

- ▶ Never ride the pedelec without air in the air suspension fork.
- ▶ Never use the pedelec without adjusting the suspension fork to the rider's weight.

#### Notice

Settings on the chassis change riding performance significantly. You need to get used to the pedelec and break it in to prevent accidents.

The adjustment shown here represents a basic setting. The rider should change the basic setting to suit the surface and his/her preferences.

- ▶ It is advisable to make a note of the basic setting. This way, it can be used as the starting point for subsequent, optimised settings and to safeguard against unintentional changes.

#### 6.3.5.1 Adjusting the negative deflection

Negative deflection (sag) is compression of the fork caused by the weight of the rider and their gear (e.g. a backpack), the sitting position and the frame geometry. This sag is not caused by riding.

Each rider has a different weight and sitting position. The sag depends on the rider's position and weight and should be between 15% and 30% of the maximum fork deflection, depending on pedelec usage and preferences.

#### 6.3.5.2 Adjusting the air suspension fork negative deflection

##### Only applies to pedelecs with this equipment

- ▶ The air valve is located under a cover on the head of the left shock absorber. Screw off the cover.



Figure 57: Screw caps in different designs

- ▶ Screw a high-pressure pump onto the valve.
- ▶ Pump the suspension fork up to the desired pressure. Never exceed the recommended maximum air pressure. Comply with the values of the filling pressure table.
- ▶ Remove the high-pressure pump.

Rider weight	AION, NEX	XCR 32, XCR 34
< 55 kg	35 - 50 psi	40 - 55 psi
55 - 65 kg	50 - 60 psi	55 - 65 psi
65 - 75 g	60 - 70 psi	65 - 75 psi
75 - 85 kg	70 - 85 psi	75 - 85 psi
85 - 95 kg	85 - 100 psi	85 - 95 psi
< 100 kg	+ 105 psi	+ 100 psi
Max. pressure	150 psi	180 psi

**Table 35: Filling pressure pump of the Suntour air forks**

- ▶ Measure the distance between the crown and the dust wiper of the fork. This distance is the total deflection of the fork.
  - ▶ Push a temporarily attached cable tie downward against the dust wiper of the fork.
  - ▶ Put on your usual bicycling clothing, including baggage.
  - ▶ Sit on the pedelec in your usual riding position and support yourself (e.g. against a wall or tree).
  - ▶ Get off the pedelec without allowing it to deflect.
  - ▶ Measure the distance between the dust wiper and the cable tie. This dimension is the sag. The sag value should be between 15% (hard) and 30% (soft) of the total fork deflection.
  - ▶ Increase or reduce the air pressure until you have reached the desired sag.
- ⇒ Once the sag is correct, re-tighten the blue air cover cap clockwise.
- ⇒ If you cannot achieve the desired sag, you may need to make an internal adjustment. For this purpose, contact your specialist dealer.

### 6.3.5.3 Adjusting the steel suspension fork negative deflection

#### Only applies to pedelecs with this equipment

You can adjust the fork by tensioning the spring to the rider's weight and their preferred riding style. It is not the coil spring hardness which is adjusted; it is its pre-tensioning. This reduces the fork's negative deflection when the rider sits on the pedelec.



**Figure 58: Negative deflection setting wheel on the suspension fork crown**

- ▶ The setting wheel may be located under a plastic cover on the suspension fork crown. Remove the plastic cover by pulling it off upwards.
  - ▶ Turn the negative deflection setting wheel in a clockwise direction to increase the spring pre-tensioning. Turn the negative deflection setting wheel in an anti-clockwise direction to reduce it.
- ⇒ The ideal setting in relation to the weight of the rider has been achieved when the shock absorber deflects 3 mm under the stationary load of the rider. Reattach the cover after the adjustment.

### 6.3.5.4 Adjusting the rebound

#### Only applies to pedelecs with this equipment

The rebound defines the speed at which the fork rebounds after being loaded. The rebound setting depends on the air pressure setting. Higher sag settings require lower rebound settings.

- ▶ Turn the rebound adjuster clockwise to the closed position until it stops.

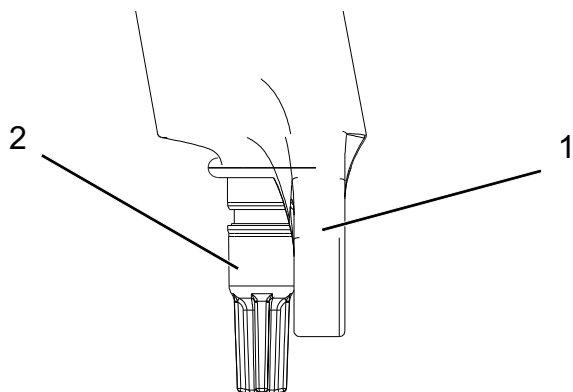


Figure 59: Suntour rebound adjuster (2) on the fork (1)

- ▶ Turn the rebound adjuster anti-clockwise.
- ⇒ Adjust the rebound in such a way that the fork rebounds quickly, but without bottoming out upward during testing. Bottoming out is where the fork rebounds too quickly and stops moving abruptly once it has reached the full rebound distance. You will hear and feel a slight knock when this occurs.

### 6.3.6 Adjusting the suspension of the FOX fork

#### Only applies to pedelecs with this equipment



#### Crash caused by incorrectly set suspension

If the suspension is adjusted incorrectly, the fork may become damaged, so that problems may occur when steering. This will cause a crash with injuries.

- ▶ Never ride the pedelec without air in the air suspension fork.
- ▶ Never use the pedelec without adjusting the suspension fork to the rider's weight.

#### Notice

Settings on the chassis change riding performance significantly. You need to get used to the pedelec and break it in to prevent accidents.

The adjustment shown here represents a basic setting. The rider should change the basic setting to suit the surface and his/her preferences.

- ▶ It is advisable to make a note of the basic setting. This way, it can be used as the starting point for subsequent, optimised settings and to safeguard against unintentional changes.

#### 6.3.6.1 Adjusting the negative deflection

Negative deflection (sag) is compression of the fork caused by the weight of the rider and their gear (e.g. a backpack), the sitting position and the frame geometry. This sag is not caused by riding. Each rider has a different weight and sitting position. The sag depends on the rider's position and weight and should be between 15% and 20% of the maximum fork deflection, depending on pedelec usage and preferences.

- ✓ When adjusting the sag, ensure that each compression adjuster is in the open position, i.e. turned clockwise until it stops.
- ✓ The pressure is to be measured at an ambient temperature of 21 to 24 °C.
- ▶ The air valve is located under a blue cover on the head of the left shock absorber. Screw off the cover anti-clockwise.

- ▶ Place a high-pressure pump on the valve.
- ▶ Pump the suspension fork up to the desired pressure. Never exceed the recommended maximum air pressure. Comply with the values of the filling pressure table.
- ▶ Remove the high-pressure pump.

Rider weight	Rhythm 34	Rhythm 36
<b>Minimum air pressure</b>	<b>40 psi (2.8 bar)</b>	<b>40 psi (2.8 bar)</b>
54 - 59 kg	58 psi	55 psi
59 - 64 kg	63 psi	59 psi
64 - 68 kg	68 psi	63 psi
68 - 73 kg	72 psi	67 psi
73 - 77 kg	77 psi	72 psi
77 - 82 kg	82 psi	76 psi
82 - 86 kg	86 psi	80 psi
86 - 91 kg	91 psi	85 psi
91 - 95 kg	96 psi	89 psi
95 - 100 kg	100 psi	93 psi
100 - 104 kg	105 psi	97 psi
104 - 109 kg	110 psi	102 psi
109 - 113 kg	114 psi	106 psi
<b>Max. pressure</b>	<b>120 psi (8.3 bar)</b>	<b>120 psi (8.3 bar)</b>

Table 36: Filling pressure table of the FOX air fork

- ▶ Measure the distance between the crown and the dust wiper of the fork. This distance is the "total deflection of the fork."
- ▶ Push the O-ring downward against the dust wiper of the fork. If an O-ring is not available, attach a cable tie to the stanchion temporarily.
- ▶ Put on your usual bicycling clothing, including baggage.
- ▶ Sit on the pedelec in your usual riding position and support yourself (e.g. against a wall or tree).
- ▶ Get off the pedelec without allowing it to deflect.

- ▶ Measure the distance between the dust wiper and the O-ring or cable tie. This dimension is the sag. The recommended sag value is between 15% (hard) and 20% (soft) of the "total fork deflection."
  - ▶ Increase or reduce the air pressure until you have reached the desired sag.
- ⇒ Once the sag is correct, re-tighten the blue air cover cap clockwise.

If you cannot achieve the desired sag, you may need to make an internal adjustment. For this purpose, contact your specialist dealer.



### 6.3.6.2 Adjusting the rebound

The rebound defines the speed at which the fork rebounds after being loaded. The rebound setting depends on the air pressure setting. Higher sag settings require lower rebound settings.

- ▶ Turn the rebound adjuster clockwise to the closed position until it stops.



Figure 60: FOX rebound adjuster (1) on the fork

- ▶ Turn the rebound adjuster anti-clockwise.
- ⇒ Adjust the rebound in such a way that the fork rebounds quickly, but without bottoming out upward during testing. Bottoming out is where the fork rebounds too quickly and stops moving abruptly once it has reached the full rebound distance. You will hear and feel a slight knock when this occurs.

## 6.3.7 Setting the Suntour rear frame damper

Only applies to pedelecs with this equipment

### 6.3.7.1 Adjusting the negative deflection

#### Notice

If the air pressure in the rear frame damper is exceeded or undershot, the damper can be permanently damaged.

Do not exceed the maximum air pressure of 300 psi (20 bar).

Negative deflection (sag) is compression of the rear frame damper caused by the weight of the rider and their gear (e.g. a backpack), the sitting position and the frame geometry. This sag is not caused by riding. Each rider has a different weight and sitting position. The sag depends on the rider's position and weight and should be between 25% and 30% of the maximum Rear frame damper, depending on pedelec usage and preferences.

- ▶ Set the compression adjuster to the OPEN position so that the sag setting is not affected.
- ▶ Remove the cap on the air valve.
- ▶ Attach a high-pressure damper pump to the valve.
- ▶ Adjust the air pressure of the damper so that it corresponds to your weight.
- ▶ Remove the high-pressure pump.
- ▶ Measure the distance between the rubber air chamber seal and the end of the damper. This distance is the "total damper deflection".
- ▶ Put on your usual bicycling clothing, including baggage. Sit on the pedelec in your usual riding position and support yourself against an object such as a wall or tree.
- ▶ Push the O-ring downward against the rubber air chamber seal.
- ▶ Get off the pedelec without allowing it to deflect.

- ▶ Measure the distance between the rubber air chamber seal and the O-ring. This dimension is the sag. The recommended sag value is between 15% (hard) and 25% (soft) of the "total damper deflection."

- ▶ Increase or reduce the air pressure until you have reached the desired sag.

### 6.3.7.2 Adjusting the rebound

The rebound defines the speed at which the rear frame damper rebounds after being loaded. The rebound setting depends on the air pressure setting. Higher sag settings require lower rebound settings.



Figure 61: Suntour rebound adjuster wheel (1) on the rear frame damper

- ▶ Turn the rebound adjuster wheel in the – direction to increase rebounding.
- ▶ Turn the rebound adjuster wheel in the + direction to reduce compressive deflection movements.

### 6.3.7.3 Setting the compression

The compression damper setting of the rear frame damper makes it possible to set the damper according to the conditions of the ground. The compression damper setting specifies the speed at which the rear frame damper deflects after being loaded.



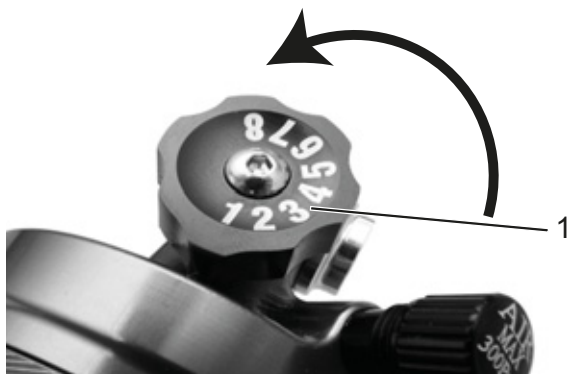


Figure 62: Suntour compression adjuster wheel (1) on the rear frame damper

- ▶ Turn the compression adjuster wheel in the – direction to increase rebounding.
- ▶ Turn the compression adjuster wheel in the + direction to reduce compressive deflection movements.

### 6.3.8 Setting the FOX rear frame damper

Only applies to pedelecs with this equipment

#### 6.3.8.1 Adjusting the negative deflection

##### Notice

If the air pressure in the rear frame damper is exceeded or undershot, the damper can be permanently damaged.

Do not exceed the maximum air pressure of 350 psi (24.1 bar). The minimum air suspension pressure of 50 psi (3.4 bar) must be complied with.

Negative deflection (sag) is compression of the rear frame damper caused by the weight of the rider and their gear (e.g. a backpack), the sitting position and the frame geometry. This sag is not caused by riding. Each rider has a different weight and sitting position. The sag depends on the rider's position and weight and should be between 25% and 30% of the maximum Rear frame damper, depending on pedelec usage and preferences.

- ▶ Set the compression adjuster to the OPEN position.
- ▶ Adjust the air pressure of the damper so that it corresponds to your weight.

- ▶ Attach the high-pressure pump to the damper. Slowly compress the damper over 25% of the deflection 10 times until you have reached the desired pressure. This equalises the air pressure between the positive and negative air chambers, and the pressure indication on the pump manometer changes accordingly.

Remove the high-pressure pump.

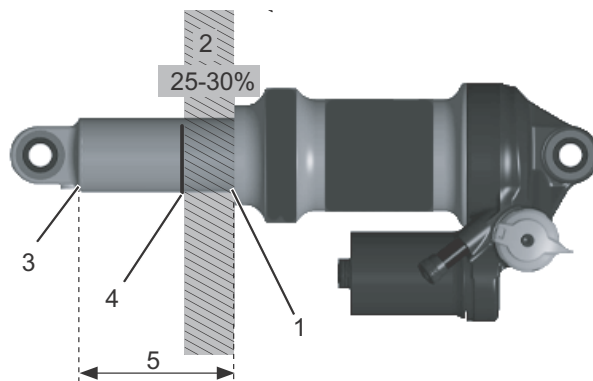


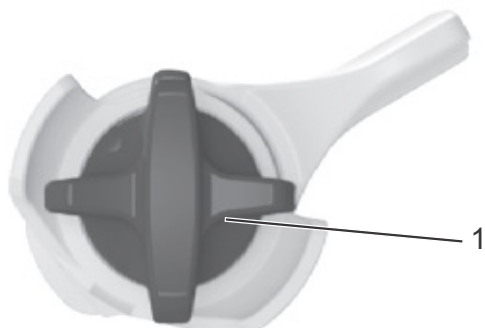
Figure 63: FOX rear frame damper

The negative deflection (2) is the distance between the O-ring (4) and the rubber air chamber seal (1). The total deflection of the rear frame damper (5) is the distance between the end of the rear frame damper (3) and the rubber air chamber seal (1)

- ▶ Measure the distance between the rubber air chamber seal (1) and the end of the damper (3). This distance is the "total damper deflection" (5).
- ▶ Put on your usual bicycling clothing, including baggage. Sit on the pedelec in your usual riding position and support yourself against an object such as a wall or tree.
- ▶ Push the O-ring (4) downward against the rubber air chamber seal (1).
- ▶ Get off the pedelec without allowing it to deflect.
- ▶ Measure the distance between the rubber air chamber seal and the O-ring. This dimension is the sag. The recommended sag value is between 25% (hard) and 30% (soft) of the "total damper deflection" (5).
- ▶ Increase or reduce the air pressure until you have reached the desired sag.

### 6.3.8.2 Adjusting the rebound

The rebound defines the speed at which the rear frame damper rebounds after being loaded. The rebound setting depends on the air pressure setting. Higher sag settings require lower rebound settings.



**Figure 64:** FOX rebound adjuster wheel (1) on the rear frame damper

- ▶ Turn the rebound adjuster clockwise to the closed position until it stops.
- ▶ Determine your rebound setting based on the air pressure. Turn the rebound adjuster back anti-clockwise by the number of clicks specified in the table below:

Air pressure (psi)	Recommended rebound setting
< 100	Open (anti-clockwise)
100 - 120	11
120 - 140	10
140 - 160	9
160 - 180	8
180 - 200	7
200 - 220	6
220 - 240	5
240 - 260	4
260 - 280	3
280 - 300	2

**Table 37:** Filling pressure table of the FOX air fork

### 6.3.9 Retracting the brake linings

New brake linings take time to break in and adjust to their final braking force.

- ▶ Accelerate pedelec to about 25 km/h.
- ▶ Brake pedelec until it comes to a halt.
- ▶ Repeat process 30–50 times.
- ▶ The brake linings and brake discs are now retracted and provide optimal braking power.

## 6.4 Accessories

We recommend a parking stand into which either the front or rear wheel can be inserted securely for pedelecs which do not have a kickstand. The following accessories are recommended:

Description	Article number
Protective cover for electrical components	080-41000 ff
Panniers, system component*	080-40946
Rear wheel basket, system component*	051-20603
Bicycle box, system component*	080-40947
Parking stand, universal stand	XX-TWO14B

**Table 38: Accessories**

\*System components are matched to the pannier rack and provide sufficient stability due to special transmission of force.

\*\*System components are matched to the drive system.

### 6.4.1 Child seat

#### WARNING

##### Crash caused by incorrect child seat

Neither the pannier rack nor the pedelec down tube are suitable for child seats and may break. Such an incorrect position may cause a crash with serious injuries for the rider and the child.

Never attach a child seat to the saddle, handlebars or down tube.

#### CAUTION

##### Crash caused by improper handling

When using child seats, the pedelec's handling characteristics and stability change considerably. This can cause a loss of control, a crash and injuries.

- ▶ You should practice how to use the child seat safely before using the pedelec in public spaces.

#### CAUTION

##### Risk of crushing due to exposed springs

The child may crush his/her fingers on exposed springs or open mechanical parts of the saddle or the seat post.

- ▶ Never install saddles with exposed springs if a child seat is being used.
- ▶ Never install seat posts with suspension with open mechanical parts or exposed springs if a child seat is being used.

#### Notice

- ▶ Observe the legal regulations on the use of child seats.
- ▶ Observe the operating and safety notes for the child seat system.
- ▶ Never exceed the total weight of the pedelec.

The specialist dealer will advise you on choosing a suitable child seat system for the child and the pedelec.

The specialist dealer must mount the child seat the first time to ensure that it is safely fitted.

When installing a child seat, the specialist dealer makes sure that the seat and the fastening mechanism for the seat are suitable for the pedelec and that all components are installed and firmly fastened. They will also ensure that shift cables, brake cables, hydraulic and electrical cables are adjusted as necessary, the rider's freedom of movement is not restricted and the pedelec's permitted total weight is not exceeded.

The specialist dealer will provide instruction on how to handle the pedelec and the child seat.

The specialist dealer will advise you on choosing a suitable child seat system for the child and the pedelec.

The specialist dealer must mount the child seat the first time to ensure that it is safely fitted.

When installing a child seat, the specialist dealer makes sure that the seat and the fastening mechanism for the seat are suitable for the pedelec and that all components are installed and firmly fastened. They will also ensure that shift

cables, brake cables, hydraulic and electrical cables are adjusted as necessary, the rider's freedom of movement is not restricted and the pedelec's permitted total weight is not exceeded.

The specialist dealer will provide instruction on how to handle the pedelec and the child seat.

### 6.4.2 Bicycle trailers

#### CAUTION

##### Crash caused by brake failure

The brake may not work sufficiently if there is an excessive trailer load. The long braking distance can cause a crash or an accident and injuries.

- ▶ Never exceed the specified trailer load.

#### Notice

- ▶ The operating and safety notes for the trailer system must be observed.
- ▶ The statutory regulations on the use of bicycle trailers must be observed.
- ▶ Only use type-approved coupling systems.

A pedelec which is approved for towing a trailer will bear an appropriate adhesive label. Only bicycle trailers with a support load and total mass which do not exceed the permitted values may be used.

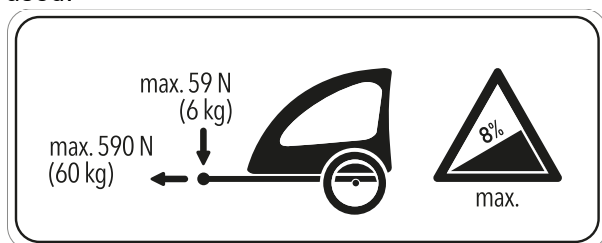


Figure 65: Trailer sign

The specialist dealer will advise on choosing a suitable trailer system for the pedelec. The specialist dealer must install the trailer the first time to ensure that it is safely fitted.

### 6.4.3 Pannier rack

The specialist dealer will advise on choosing a suitable pannier rack.

The specialist dealer must mount the pannier rack the first time to ensure that it is safely fitted.

When installing a pannier rack, the specialist dealer will make sure that the fastening mechanism for the rack is suitable for the pedelec and that all components are installed and firmly fastened. They will also ensure that shift cables, brake cables and hydraulic and electrical lines are adjusted as necessary, the rider's freedom of movement is not restricted and the permitted total weight of the pedelec is not exceeded.

The specialist dealer will provide instruction on how to handle the pedelec and the pannier rack.

## 6.5 Before each ride



### Crash caused by difficult-to-spot damage

If the pedelec topples over or you have a fall or an accident, there may be difficult-to-spot damage to components such as the brake system, quick releases or *frame*. This may cause a crash with injuries.

- ▶ Take the pedelec out of service and have a specialist dealer carry out an inspection.

### Crash caused by material fatigue

Intensive use can cause material fatigue. A component may suddenly fail in case of material fatigue. This may cause a crash with injuries.

- ▶ Remove the pedelec from service immediately if there are any signs of material fatigue. Have the specialist dealer check the state.
- ▶ Have the specialist dealer carry out a basic inspection regularly. During the inspection, the specialist dealer will inspect the pedelec for any signs of material fatigue on the frame, fork, suspension element mountings (if there are any) and components made of composite materials.

Carbon becomes brittle when exposed to heat radiation such as heating. This can cause the carbon part to break and result in a crash with injuries.

- ▶ Never expose carbon parts on the pedelec to strong sources of heat.

## 6.6 Check list before each ride

- ▶ Check the pedelec before each ride.
- ⇒ Do not use the pedelec if there is evidently something wrong with it.

<input type="checkbox"/>	Check that the pedelec is complete.
<input type="checkbox"/>	Check the battery is firmly in place.
<input type="checkbox"/>	Check that the lighting, reflector and brake, for instance, are sufficiently clean.
<input type="checkbox"/>	You must check that the mudguards, the pannier rack and the chain guard are securely installed.
<input type="checkbox"/>	Check that the front and rear wheels run true. This is particularly important if the pedelec been transported or secured with a lock.
<input type="checkbox"/>	Check the valves and the tyre pressure. Adjust as necessary before each ride.
<input type="checkbox"/>	If the pedelec has a hydraulic rim brake, check whether the locking levers are fully closed in their final positions.
<input type="checkbox"/>	Check the front and rear wheel brakes to make sure that they are working properly. To do so, push the brake levers while stationary to check whether resistance is generated in the usual brake lever position. The brake must not lose any brake fluid.
<input type="checkbox"/>	Check that the driving light is working.
<input type="checkbox"/>	Check for unusual noises, vibrations, smells, staining, deformation, cracks, scores, abrasion and wear. This indicates material fatigue.
<input type="checkbox"/>	Inspect suspension system for cracks, dents, bumps, parts or leaking oil. Look at concealed sections on the pedelec's lower surface.
<input type="checkbox"/>	Use body weight to compress suspension system. Adjust to the optimum sag value if suspension is too soft.
<input type="checkbox"/>	If quick releases are used check them to make sure that they are fully closed in their end position. If quick release axle systems are used, make sure that all attachment screws are tightened to the correct torque.
<input type="checkbox"/>	Be alert to any unusual operating sensations when braking, pedalling or steering.

## 6.7 Using the kickstand

### CAUTION

#### Crash caused by a lowered kickstand

The kickstand does not fold up automatically. There is a risk of crashing if riding with the kickstand lowered.

- ▶ Raise the kickstand completely before the ride.

### Notice

The pedelec's force of weight may cause the kickstand to sink into soft ground and the pedelec may topple over.

- ▶ The pedelec must be parked on firm, level ground only.
- ▶ It is particularly important to check that the pedelec is stable if it is equipped with accessories or loaded with baggage.

### 6.7.1 Raising the kickstand

- ▶ Use your foot to raise the kickstand completely before setting off.

#### 6.7.1.1 Parking the pedelec

- ▶ Use your foot to lower the kickstand completely before parking.
- ▶ Park the pedelec carefully and check that it is stable.

## 6.8 Using the pannier rack

### CAUTION

#### Crash caused by loaded pannier rack

The pedelec is handled differently with a loaded *pannier rack*, in particular when the rider needs to steer and brake. This can lead to a loss of control. This may cause a crash with injuries.

- ▶ You should practice how to use a loaded *pannier rack* safely before using the pedelec in public spaces.

### CAUTION

#### Crash caused by unsecured baggage

Loose or unsecured objects on the *pannier rack*, e.g. belts, may become caught in the rear wheel. This may cause a crash with injuries.

Objects which are fastened to the pannier rack may cover the pedelec's *reflectors* and the *driving light*. Other users may not see the pedelec on public roads as a result. This may cause a crash with injuries.

- ▶ Secure any objects which are attached to the *pannier rack* sufficiently.
- ▶ Objects fastened to the *pannier rack* must never cover the *reflectors*, the *headlight* or the *rear light*.

#### Crushing the fingers in the spring flap

The spring flap on the *pannier rack* operates with a high clamping force. There is a risk of crushing the fingers.

- ▶ Never allow the spring flap to snap shut in an uncontrolled manner.
- ▶ Be careful where you position your fingers when closing the spring flap.

### Notice

The maximum load bearing capacity is indicated on the *pannier rack*.

- ▶ Never exceed the permitted *total weight* when packing the pedelec.
- ▶ Never exceed the maximum load bearing capacity of the pannier rack.
- ▶ Never modify the *pannier rack*.
- ▶ Distribute the baggage as evenly as possible on the left- and right-hand side of the pedelec.
- ▶ We recommend the use of panniers and baggage baskets.

## 6.9 Rechargeable battery

### WARNING

#### Risk of fire and explosion due to faulty battery

The safety electronics on a damaged or faulty battery may fail. The residual voltage can cause a short circuit. The battery may self-ignite and explode.

- ▶ Remove batteries with external damage from service immediately and never charge them.
- ▶ Only operate the battery and accessories if they are in perfect condition.
- ▶ Only use batteries which are approved for use on your pedelec.
- ▶ Do not use the battery with defective connecting cables or defective contacts.
- ▶ Use the battery with BMZ Systems e-bikes only. This is the only way that the battery will be protected from dangerous overloading.
- ▶ If the battery becomes deformed or begins to smoke, keep at a safe distance, disconnect the power supply at the socket, and notify the fire service immediately.
- ▶ Never extinguish a damaged battery with water or allow it to come into contact with water.
- ▶ If a battery is dropped or struck but shows no signs of external damage, remove it from service and observe it for at least 24 hours.
- ▶ Faulty batteries are hazardous goods. Dispose of faulty batteries properly and as quickly as possible.
- ▶ Store in a dry place until disposal. Never store in the vicinity of flammable substances.
- ▶ Never open or repair the battery.
- ▶ Charge the battery before use. Only use the charger included in the scope of delivery.
- ▶ Avoid wide temperature fluctuations.

### WARNING

- ▶ Do not use the battery at altitudes higher than 2,000 m.

### CAUTION

#### Chemical burns to the skin and eyes caused by faulty battery

Liquids and vapours may leak from a damaged or faulty battery. Excessive temperatures can also cause liquid to leak from the battery and the battery will become damaged. Such liquids can irritate the airways and cause burns.

- ▶ Avoid contact with leaked liquids.
- ▶ Immediately consult a doctor in case of contact with the eyes or any discomfort.
- ▶ In case of contact with the skin, rinse off immediately with water.
- ▶ Ventilate the room well.
- ▶ Protect the battery against heat over 60 °C, e.g. against permanent direct sunlight.

#### Risk of fire and explosion due to short circuit

Small metal objects may jumper the electrical connections of the battery. The battery may self-ignite and explode.

- ▶ Keep paper clips, screws, coins, keys and other small parts away and do not insert them into the battery.

#### Risk of fire and explosion due to penetration by water

The battery is only protected from simple spray water. Penetration by water can cause a short circuit. The battery may self-ignite and explode.

- ▶ Never immerse the battery in water.
- ▶ Never clean the battery with pressure washer
- ▶ If there is reason to believe that water may have entered into the battery, the battery must be removed from service.

## Notice

If you leave a key inserted when riding or transporting the pedelec, it may break off or the locking system may open accidentally.

- ▶ Remove the key from the battery lock immediately after use.
- ▶ We recommend that you attach the key to a key ring.

✓ Switch off the battery and the drive system before removing or inserting the battery.

### 6.9.1 Removing the battery

- ▶ Open the battery lock with the key.
- ⇒ The battery is released and falls into the retainer guard.
- ▶ Hold the battery in your hand from below. Use the other hand to push on the retainer guard from above.
- ⇒ The battery is released and falls into the hand.
- ▶ Remove the battery from the frame.
- ▶ Remove the key from the lock.

### 6.9.2 Inserting the battery

- ▶ Place the battery into the lower mount with the contacts facing the front.
- ▶ Flip the battery up, so that it is held by the retainer guard.
- ▶ Push the battery upwards so that it audibly clicks into place.
- ▶ Check the battery to make sure it is firmly in place.
- ▶ Lock the battery with the key. Otherwise the battery may fall out of the mount when you open the lock.
- ▶ Remove the key from the lock.

### 6.9.3 Charging the battery



#### Fire caused by overheated charger

The charger heats up when charging the battery. In case of insufficient cooling, this can result in fire or burns to the hands.

- ▶ Never use the charger on a highly flammable surface (e.g. paper, carpet etc.).
- ▶ Never cover the charger during the charging process.
- ▶ Never leave a battery charging unattended.

#### Electric shock caused by penetration by water

If water penetrates into the charger, there is a risk of electric shock.

- ▶ Never charge the battery outdoors.

#### Electric shock in case of damage

Damaged chargers, cables and plug connectors increase the risk of electric shock.

- ▶ Check the charger, cable and plug connector before each use. Never use a damaged charger.

#### Risk of fire and explosion caused by damaged battery

The safety electronics on a damaged or faulty battery may fail. The residual voltage can cause a short circuit. The battery may self-ignite and explode.

- ▶ If the battery becomes deformed or begins to smoke, keep at a safe distance, disconnect the power supply at the socket, and notify the fire service immediately.
- ▶ Never extinguish a damaged battery with water or allow it to come into contact with water.



**Notice**

▶ If an error occurs during the charging process, a system message is displayed. Remove the charger and battery from operation immediately and follow the instructions.

✓ The ambient temperature during the charging process must be within the range from 10 °C to 30 °C.

Charging temperature	10 °C - 30 °C
----------------------	---------------

✓ The battery can remain on the pedelec or can be removed for charging.

✓ Interrupting the charging process does not damage the battery.

▶ Remove the rubber cover from the battery.

▶ Connect the mains plug of the charger to a normal domestic, grounded socket.

Connection data	230 V, 50 Hz
-----------------	--------------

▶ Connect the charging cable to the battery's charging port. Only use the charger supplied in the scope of delivery.

⇒ The charging process starts automatically.

⇒ During the charging process the operating status and battery level indicator shows the charge level. When the drive system is switched on, the *display screen* will show the charging process.

LED 1,2,3,4,5	Battery level
● ● ● ● ●	100 - 80%
● ● ● ● ○	79 - 60%
● ● ● ○ ○	59 - 40%
● ● ○ ○ ○	39 - 20%
● ○ ○ ○ ○	19 - 10%
★ ○ ○ ○ ○	9 - 0%

**Table 39: Battery level indicator**

⇒ The charging process is complete when the LEDs on the operating status and battery level indicator go out.

**6.9.4 Waking the battery**

✓ When not used for a longer period, the battery switches to sleep mode for self-protection. The LEDs on the operating status and battery level indicator do not light up.

▶ Press the *On-Off button (battery)*.

▶ The operating status and battery level indicator shows the charge level.

## 6.10 Electric drive system

### 6.10.1 Switching on the electric drive system



#### Crash caused by lack of readiness for braking

When it is switched on, the drive system can be activated by the application of force on the pedals. There is a risk of a crash if the drive is activated unintentionally, and the brake is not reached.

- ▶ Never start the electric drive system, or switch it off immediately, if the brake cannot be reached safely and reliably.

- 
- ✓ A sufficiently charged battery has been inserted into the pedelec.
  - ✓ The battery is firmly positioned. The key has been removed.
  - ▶ Press the **On-Off button (operating element)**.  
or
  - ▶ Press the **On-Off button (battery)** briefly.
  - ⇒ The indicator will switch on after a few seconds.
  - ⇒ If the drive system is switched on, the drive is activated as soon as the pedals are moved with sufficient force.

### 6.10.2 Switching off the drive system

The system switches off automatically several minutes after the last command. The following options are available to manually switch off the drive system:

- ▶ Press the **On-Off button (operating element)**.  
or
- ▶ Press the **On-Off button (battery)** for a long time.
- ⇒ The display and LEDs on the battery level indicator disappear.

## 6.11 Control panel with display

### 6.11.1 Using the driving light

- ✓ To switch on the *driving light*, the drive system needs to be switched on first.
- ▶ Press the **up button** for a long time (> 1 second).
- ⇒ The headlight is now switched on. The backlight switches from daytime to night mode. The driving light symbol is activated.
- ⇒ The interface daytime and night modes are displayed as follows:
- ▶ Press the **up button** for a long time (> 1 second).
- ⇒ The headlight is switched off. The backlight switches from night to daytime mode. The driving light symbol is deactivated.

### 6.11.2 Using the push assist system



#### Injury from pedals or wheels

The pedals and the drive wheel turn when the push assist system is used. There is a risk of injury if the pedelec wheels are not in contact with the ground when the push assist system is used (e.g. when carrying the pedelec up stairs or when placing it on a bicycle rack).

- ▶ Only use the push assist mode when pushing the pedelec.
- ▶ You must steer the pedelec securely with both hands when using push assist.
- ▶ Allow for enough freedom of movement for the pedals.

#### Crash caused by strong acceleration

If the pedals are pressed with the push assist activated, the pedelec accelerates rapidly. This may cause a crash with injuries.

- ▶ Never mount the pedelec with the push assist activated.

## Notice

The pedals turn when using the push assist due to the system design.

- ▶ You must steer the pedelec securely with both hands when using push assist.
- ▶ Allow for enough freedom of movement for the pedals.
- ▶ Never use a push assist for slow riding.

The push assist helps the rider to push the pedelec. The maximum speed can be 6 km/h here.

- ▶ Press the **down button** for a long time (> 2 seconds).

The push assist is activated. The *push assist symbol* is displayed.

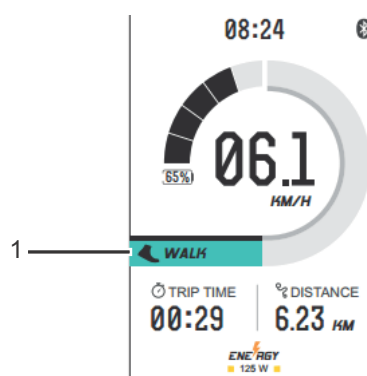


Figure 66: Indicator when push assist system activated with push assist symbol (1)

- ▶ Release the **push assist button** to shut off the push assist.

### 6.11.3 Using the USB port

#### Notice

Any moisture which enters through the USB port may trigger a short circuit in the *display*.

- ▶ Regularly check the position of the rubber cover on the USB port and adjust it as necessary.

The USB port can be used to operate external devices which can be connected using a standard micro A/micro B USB 2.0 cable.

- ▶ Open the protective flap on the USB port.
- ▶ Using a suitable USB cable, connect the USB interface and the desired end device.
- ⇒ The "CHARG" screen will appear briefly on the display.
- ▶ Replace the protective flap after using the USB port.

### 6.11.4 Selecting the level of assistance

- ▶ Press the **up button**.
- ⇒ The level of assistance is increased.
- ▶ Press the **down button**.
- ⇒ The level of assistance is reduced.

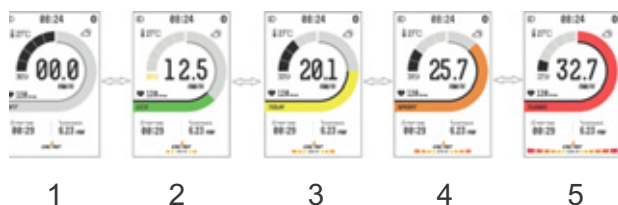


Figure 67: Level of assistance indicators

Colour	Designation
1 Grey	Off
2 Green	ECO
3 Yellow	Tour
4 Orange	Sport
5 Red	Turbo

Table 40: Overview of level of assistance

### 6.11.5 Switching the journey information

- ▶ Press the **function button** briefly.

The function display shows three different items of information one after the other:

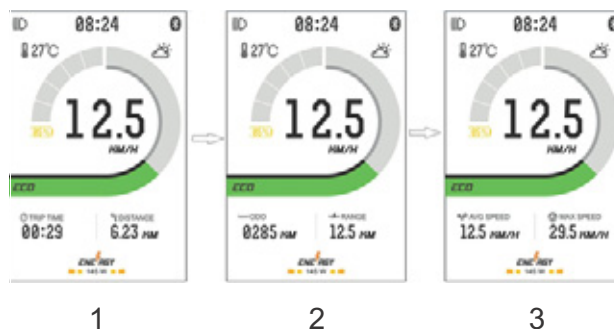


Figure 68: Journey information indicator

Colour	Designation
1	Trip time Trip
2	Overall distance (ODO) Range
3	Average speed (AVG Speed) Maximum speed (Max Speed)

Table 41: Overview of journey information

### 6.11.6 Changing the system information

The rider can change the values of the system settings.

Screen display	Function
UNIT SETTING	Change units
BACKLIGHT SETTING	Set the backlight brightness
CLOCK SETTING	Set clock
PASSWORD SETTING	Change password
TIME PERIOD FOR AUTOMATIC SHUT-OFF	Set time period for automatic shut-off
RESET TO FACTORY SETTING	Reset to factory setting

Table 42: List of system settings

- ✓ The drive system must be switched on for at least 10 seconds.
- ▶ Press the **function button** for a long time (> 3 seconds).

The settings menu will open. The rider can read or change all information in the settings menu. The activated menu item is highlighted in yellow.

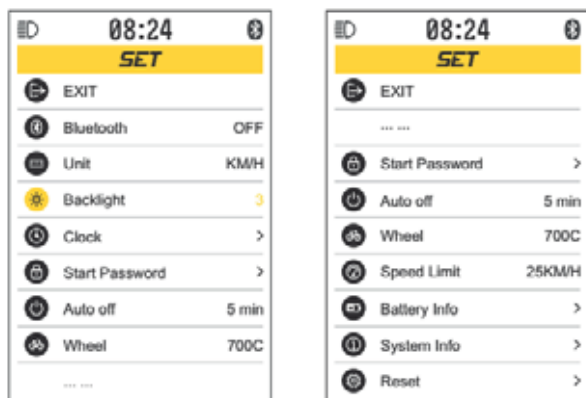
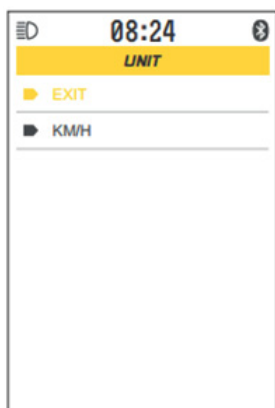


Figure 69: Settings menu

- ▶ The settings menu closes if the rider does not make an input within ten seconds.
- ▶ You can use the **up button** and **down button** to scroll through the menu.
- ▶ Press on the **function button** to open a sub-menu option.
- ▶ Press the **function button** for a long time (> 3 seconds) to change the setting or return to the main display screen. You can also select the EXIT menu option and press on the **function button** briefly to close the settings menu.

### 6.11.6.1 Setting units

- ▶ Open the UNIT menu sub-option in the settings menu.



- ▶ Press the **up button** or **down button** briefly to select km/h (kilometres per hour) or MPH (miles per hour)
- ▶ Press on the **function button** briefly.

Figure 70: Selecting units

- ⇒ The selected unit is saved and will be used from now on. The settings menu is open.

### 6.11.6.2 Setting the backlight

- ▶ Open the BACKLIGHT menu sub-option in the settings menu.



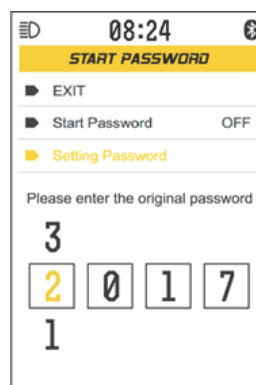
- ▶ Press on the **up button** or **down button** briefly to select the brightness level. You can choose between 1 to 5.
- ▶ Press on the **function button** briefly.

Figure 71: Setting the backlight

- ⇒ The selected unit is saved and will be used from now on. The settings menu is open.

### 6.11.6.3 Changing the password

- ▶ Open the START PASSWORD menu sub-option in the settings menu.

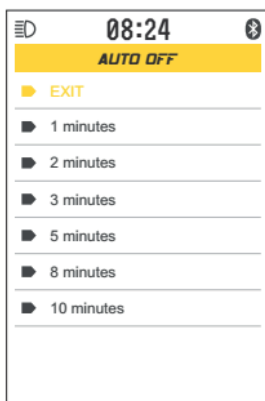


- ▶ Press on the **up button** or **down button** briefly to change the number in the password.
- ▶ Press on the **function button** briefly.
- ⇒ The new password is saved and will be used from now on. The settings menu is open.

Figure 72: Changing the password

#### 6.11.6.4 Setting the automatic disconnect time

- ▶ Open the AUTO OFF menu sub-option in the settings menu.

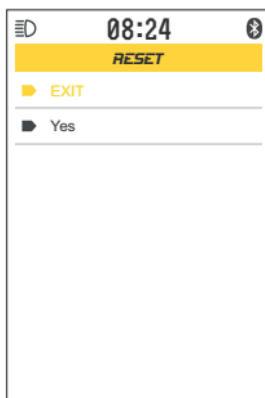


- ▶ Press on the **up button** or **down button** briefly to select the disconnect time.
- ▶ Press on the **function button** briefly.
- ▶ The disconnect time is saved and will be used from now on. The settings menu is open.

Figure 73: Setting the automatic disconnect time

#### 6.11.6.5 Resetting the settings

- ▶ Open the RESET menu sub-option in the settings menu.

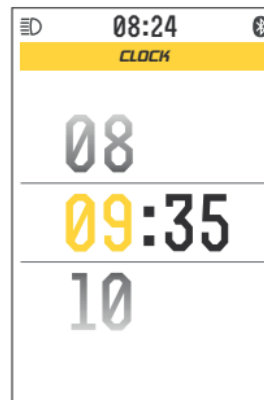


- ▶ Press on the **up button** or **down button** briefly to select YES.
- ▶ Press on the **function button** briefly.
- ▶ All settings are re-set to the factory settings. The settings menu is open.

Figure 74: Resetting the settings

#### 6.11.6.6 Setting the clock

- ▶ Open the CLOCK menu sub-option in the settings menu.



- ▶ Press on the **up button** or **down button** briefly to set the time.
- ▶ Press on the **function button** briefly.
- ▶ Press on the **up button** or **down button** briefly to set the minutes.

Figure 75: Setting the clock

- ▶ Press on the **function button** briefly.
- ⇒ The set time is saved and will be used from now on. The settings menu is open.

## 6.12 Brake

### DANGER

#### Hydraulic fluid can be fatal if it is swallowed and penetrates into the respiratory system

Hydraulic fluid may leak out after an accident or due to material fatigue. Hydraulic fluid can be fatal if swallowed and inhaled.

#### First aid treatment

- ▶ Wear gloves and safety goggles as protective equipment. Keep unprotected persons away.
- ▶ Remove those affected from the danger area to fresh air. Never leave those affected unattended.
- ▶ Ensure sufficient ventilation.
- ▶ Immediately remove clothing items contaminated with hydraulic fluid.
- ▶ Serious slip hazard due to hydraulic fluid leakage.
- ▶ Keep away from naked flames, hot surfaces and sources of ignition.
- ▶ Avoid contact with skin and eyes.
- ▶ Do not inhale vapours or aerosols.

#### After inhalation

- ▶ Take in fresh air; consult doctor if any pain or discomfort.

#### After skin contact

- ▶ Wash affected skin with soap and water and rinse well. Remove contaminated clothing. Consult doctor if any pain or discomfort.

#### After contact with eyes

- ▶ Rinse eyes under flowing water for at least ten minutes with the lids open; also rinse under lids. Consult eye doctor if pain or discomfort continues.

### DANGER

#### After swallowing

- ▶ Rinse out mouth with water. Never induce vomiting! Risk of aspiration!
- ▶ Place a person lying on their back who is vomiting in a stable recovery position on their side. Seek medical advice immediately.

#### Environmental protection measures

- ▶ Never allow hydraulic fluid to flow into the sewage system, surface water or groundwater.
- ▶ Notify the relevant authorities if fluid penetrates the ground or pollutes water bodies or the sewage system.

### WARNING

#### Crash caused by brake failure

Oil or lubricant on the brake disc in a disc brake or on the rim of a rim brake can cause the brake to fail completely. This may cause a crash with serious injuries.

- ▶ Never allow oil or lubricant to come into contact with the brake disc or brake linings or on the rim of a rim brake.
- ▶ If the brake linings have come into contact with oil or lubricant, contact a dealer or a workshop to have the components cleaned or replaced.

If the brakes are applied continuously for a long time (e.g. while riding downhill for a long time), the fluid in the brake system may heat up. This may create a vapour bubble. This will cause air bubbles or any water contained in the brake system to expand. This may suddenly make the lever travel wider. This may cause a crash with serious injuries.

- ▶ Release the brake regularly when riding downhill for a longer period of time.

**WARNING****Amputation due to rotating brake disc**

The brake disc in disc brakes is so sharp that it can cause serious injuries to fingers if they are inserted into the disc brake openings.

Always keep fingers well away from the rotating brake disc.

**CAUTION****Crash caused by wet conditions**

The *tyres* may slip on wet roads. In wet conditions you must also expect a longer braking distance. The braking sensation differs from the usual sensation. This can cause loss of control or a crash, which may result in injuries.

- ▶ Ride slowly and brake in good time.

**Crash caused by incorrect use**

Handling the brake improperly can lead to loss of control or crashes, which may result in injuries.

- ▶ Shift your body weight backwards and down as far as possible.
- ▶ Practice braking and emergency braking before using the pedelec in public spaces.
- ▶ Never use the pedelec if you can feel no resistance when you grip the brake handle. Consult a specialist dealer.

**Burns caused by heated brake**

The brakes may become very hot during operation. There is a risk of burns or fire in case of contact.

- ▶ Never touch the components of the brake directly after the ride.

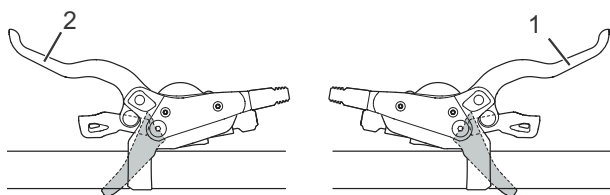
**CAUTION****Crash after cleaning or storage**

The brake system is not designed for use on a pedelec which is placed on its side or turned upside down. The brake may not function correctly as a result. This can cause a crash, which may result in injuries.

- ▶ If the pedelec is placed on its side or turned upside down, apply the brake a couple of times before setting off to ensure that it works as normal.
- ▶ Never use the pedelec if it no longer brakes as normal. Consult a specialist dealer.

The drive force of the motor is shut off during the ride as soon as the rider no longer pedals. The drive system does not switch off when braking.

- ▶ In order to achieve optimum braking results, do not pedal while braking.

**6.12.1 Using the brake lever**

**Figure 76: Front (2) and rear (1) brake lever; Shimano brake used as an example**

- ▶ Push the *left brake lever for the front wheel brake and the right lever for the rear wheel brake* until the desired speed is reached.



## 6.12.2 Using the back-pedal brake

### Only applies to pedelecs with this equipment

- ✓ The best braking effect is achieved if the pedals are in the 3 o'clock and 9 o'clock position when braking. To bridge the free travel between the riding movement and the braking movement, it is recommendable to pedal a little beyond the 3 o'clock and 9 o'clock position before you pedal in the opposite direction to the *direction of travel* and start braking.
- ▶ Pedal in the opposite direction to the *direction of travel* until the desired speed has been reached.

## 6.13 Suspension and damping

### 6.13.1 Adjusting the compression of the Fox fork

#### Only applies to pedelecs with this equipment

The compression adjuster makes it possible to make quick adjustments to the suspension behaviour of the fork to suit changes in terrain. It is intended for adjustments made during the ride.

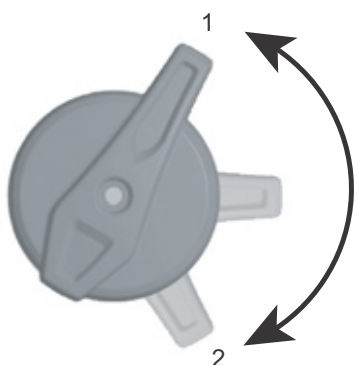


Figure 77: FOX compression adjuster with the OPEN (1) and HARD (2) positions

- ▶ Compression damping is lowest in the OPEN position, making the fork feel softer. Use the HARD position if you want the fork to feel stiffer and you are riding on soft ground. The lever positions between the OPEN and HARD positions enable fine adjustment of compression damping.

We recommend setting the lever of the compression adjuster to the OPEN mode position first.

## 6.13.2 Adjusting the compression of the Fox damper

### Only applies to pedelecs with this equipment

The compression adjuster makes it possible to make quick adjustments to the suspension behaviour of the damper to suit changes in terrain. It is intended for adjustments made during the ride.



Figure 78: FOX compression adjuster on the rear frame damper with the OPEN (1), MEDIUM (2) and HARD (3) positions

- ▶ Use the OPEN position for rough descents, the MEDIUM position for rough terrain and the HARD position for efficient climbing. First set the compression adjuster to the OPEN position.

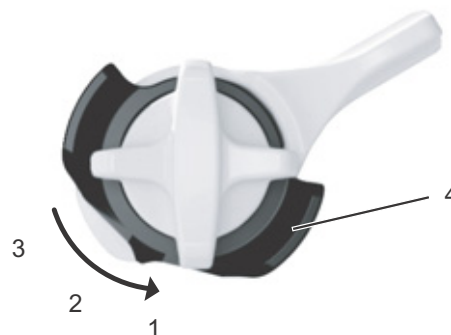


Figure 79: Fine adjustment of the OPEN position is made using the adjuster (4)

The FOX rear frame damper features fine adjustment for the OPEN position.

- ✓ We recommend that fine adjustments be made when the compression adjuster is in the MEDIUM or HARD position.
- ▶ Pull out the adjuster.
- ▶ Turn the adjuster to position 1, 2 or 3. Setting 1 is for the softest riding performance, whereas 3 is for the hardest.
- ▶ Press the adjuster in to lock in the setting.

### 6.13.3 Adjusting the compression of the Suntour fork

#### Only applies to pedelecs with this equipment

The compression adjuster makes it possible to make quick adjustments to the suspension behaviour of the fork to suit changes in terrain. It is intended for adjustments made during the ride.



Figure 80: Suntour compression adjuster with the OPEN (1) and LOCK (2) positions

- Compression damping is lowest in the OPEN position, making the fork feel softer. Use the LOCK position if you want the fork to feel stiffer and you are riding on soft ground. The lever positions between the OPEN and LOCK positions enable fine adjustment of compression damping.

We recommend setting the lever of the compression adjuster to the OPEN position first.

### 6.13.4 Adjusting the compression of a Suntour damper

#### Only applies to pedelecs with this equipment

The compression adjuster makes it possible to make quick adjustments to the suspension behaviour of the damper to suit changes in terrain. It should never be used while riding on rough terrain.



Figure 81: Suntour compression adjuster open (1)

- Use the OPEN position for rough descents and the LOCK position for efficient climbing. First set the compression adjuster to the OPEN position.



Figure 82: Suntour compression adjuster closed (2)

### 6.13.5 Adjusting the rebound in a Rock Shox damper

Only applies to pedelecs with this equipment

The rebound damper determines the speed at which the fork rebounds to full length after deflection. This speed affects the wheel's contact with the ground and thus has an influence on control and efficiency. The rear frame damper should rebound fast enough to sustain traction without producing an erratic or bumpy sensation. If rebound damping is too tight, the rear frame damper is unable to rebound fast enough before the next impact. The rebound damper for the rear wheel is located in the rear frame damper.



Figure 83: Setting the rebound damper strength on the rear frame damper setting wheel (1)

- ▶ Turn the setting wheel to the middle position.
- ▶ Ride the pedelec over a small obstacle.
- ⇒ The ideal setting for the rebound damper has been achieved when the rebound movement of the rear wheel feels comparable to that of the front wheel.
- ▶ If the rear wheel bounces back much more quickly or slowly than the front wheel, change the setting by turning the setting wheel.
  - Turn the setting wheel in an anti-clockwise direction to increase the rebound speed.
  - Turn the setting wheel in a clockwise direction to decrease the rebound speed.

### 6.13.6 Adjusting the compression in a Rock Shox damper

Only applies to pedelecs with this equipment

The compression damper controls the speed at which the rear frame damper deflects during slow impact, such as smaller impacts or when the rider goes round a corner or shifts their weight. The damper improves control and efficiency.

If the compression damper is set too high, the suspension is too hard during impacts. The lever is used to set the compression damper.

- Turn the setting wheel in a clockwise direction (+) to decrease the deflection speed.
- ▶ Turn the setting wheel in an anti-clockwise direction (-) to increase the deflection speed.

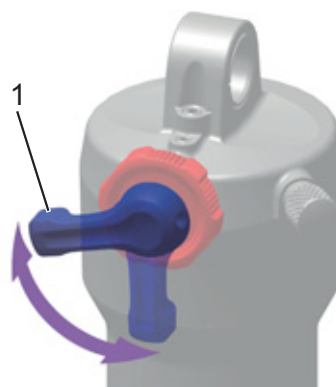


Figure 84: Setting the compression damper strength using the rear frame damper setting lever (1)

## 6.14 Gear shift

The selection of the appropriate gear is a prerequisite for a physically comfortable ride and making sure that the electric drive system functions properly. The ideal pedalling frequency is between 70 and 80 revolutions per minute.

- ▶ It is advisable to stop pedalling briefly when changing gears. This makes it easier to switch gears and reduces wear on the drivetrain.

### 6.14.1 Selecting gears

#### Only applies to pedelecs with this equipment

The speed and range can be increased while applying the same force if you select the right gear. Use the derailleur gears.

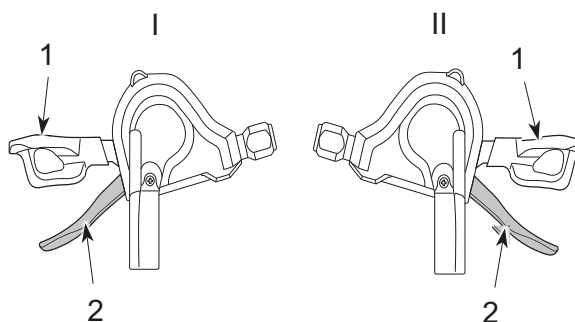


Figure 85: Down shifter (1) and up shifter (2) on the left (I) and right (II) gear shift

- ▶ Select the appropriate gear with the *shifter*.
- ⇒ The gear shift switches the gear.
- ⇒ The shifter returns to its original position.
- ▶ Clean the rear derailleur if the gear change blocks.

### 6.14.2 Using a hub gear

#### Only applies to pedelecs with this equipment



**CAUTION**

#### Crash caused by incorrect use

If the rider applies too much pressure on the pedals during a gear change and activates the shifter or changes several gears at a time, their feet may slip from the pedals. As a result, the pedelec may flip over or fall, which may cause injury.

Switching down several gears to a low gear may cause the twist grip outer sleeve to suddenly come off. This will not have an adverse effect on the twist grip's correct functioning since the outer guide returns to its original position after the gear change is complete.

- ▶ Apply little pressure on the pedals while changing gears.
- ▶ Never change more than one gear at a time.

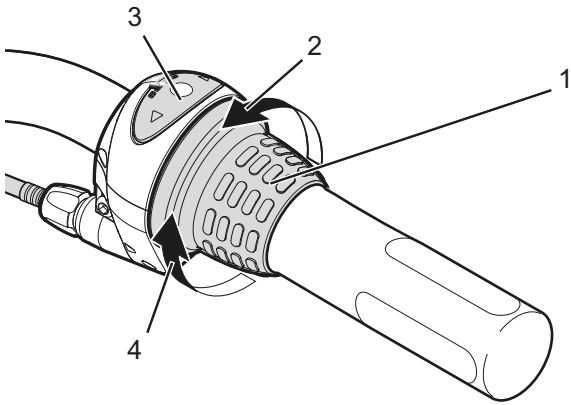
#### Notice

The interior hub is not completely waterproof. If water gets into the hub, it may rust and the gear switch function may no longer function as a result.

- ▶ Never use the pedelec in places where water may get into the hub.

In rare cases, noises may be heard from the rear derailleur in the hub interior after a gear change. This is normal when gears are changed.

Do not detach the hub. If you need to detach it, contact your dealer.



**Figure 86: Example; Shimano Nexus gear shift: twist grip (1) for the hub gear with its screen (3), the direction of rotation to switch up a gear (2) and the direction of rotation to switch down a gear (4)**

- ▶ Turn the twist grip.
- ⇒ The gear shift switches the gear.
- ⇒ The number on the screen display shows the changed gear.

## 7 Cleaning and servicing

### Cleaning check list

<input type="checkbox"/>	Clean the pedals	after each ride
<input type="checkbox"/>	Clean the suspension fork and, if necessary, rear frame damper	after each ride
<input type="checkbox"/>	Cleaning the battery	once a month
<input type="checkbox"/>	Chain (mainly tarmacked road)	every 250–300 km
<input type="checkbox"/>	Basic cleaning and preservation of all components	at least every six months
<input type="checkbox"/>	Clean the charger	at least every six months
<input type="checkbox"/>	Clean and lubricate the height-adjustable seat post	every six months

### Maintenance check list

<input type="checkbox"/>	Check USB rubber cover position	before each ride
<input type="checkbox"/>	Check for tyre wear	once a week
<input type="checkbox"/>	Check for rim wear	once a week
<input type="checkbox"/>	Check tyre pressure	once a week
<input type="checkbox"/>	Check brakes for wear	once a month
<input type="checkbox"/>	Check electrical cables and Bowden cables for damage and ensure they are fully functional	once a month
<input type="checkbox"/>	Check chain tension	once a month
<input type="checkbox"/>	Check tension of the spokes	every three months
<input type="checkbox"/>	Check the gear shift setting	every three months
<input type="checkbox"/>	Check suspension fork and, if necessary, rear frame damper for wear and ensure fully functional	every three months
<input type="checkbox"/>	Check for wear on brake discs	at least every six months



### Crash and falling caused by unintentional activation

There is a risk of injury if the drive system is activated unintentionally.

- ▶ Remove the battery before inspection.

The following servicing measures must be performed regularly. Servicing can be performed by the operator and rider. In case of any doubt, consult the specialist dealer.

### 7.1 Cleaning after each ride

#### Required tools and cleaning agents:

- Cloth
- Air pump
- Brush
- Water
- Dish-washing liquid
- Bucket

#### 7.1.1 Cleaning the suspension fork

- ▶ Remove dirt and deposits on the stanchions and deflector seals with a damp cloth.
- ▶ Check the stanchions for dents, scratches, staining or leaking oil.
- ▶ Check the air pressure.
- ▶ Lubricate the dust seals and stanchions.

#### 7.1.2 Cleaning the rear frame damper

- ▶ Remove dirt and deposits from the damper body with a damp cloth.
- ▶ Check rear frame damper for dents, scratches, staining or leaking oil.

#### 7.1.3 Cleaning the pedals

- ▶ Clean with a brush and soapy water after riding through dirt or rain.
- ⇒ Service the pedals after cleaning.

## 7.2 Basic cleaning



### CAUTION

#### Crash caused by brake failure

The braking effect may be unusually poor temporarily after cleaning, servicing or repairing the pedelec. This may cause a crash with injuries.

- ▶ Never apply care products or oil to the brake discs or brake linings, or the braking surfaces on the rims.
- ▶ After cleaning, servicing or repair, carry out a few test brake applications.

### Notice

Water may enter into the inside of the bearings if you use a steam jet. This dilutes the lubricant inside, the friction increases and, as a result, the bearings are permanently damaged in the long term.

- ▶ Never clean the pedelec with a steam jet.

Greased parts, such as the seat post, the handlebars or the stem, may no longer be safely and reliably clamped.

- ▶ Never apply grease or oil to clamping sections.

#### Required tools and cleaning agents:

- Cloths
- Sponge
- Air pump
- Brush
- Toothbrush
- Paintbrush
- Watering can
- Bucket
- Water
- Dish-washing liquid
- Degreaser
- Lubricant
- Brake cleaner or spirit

- ✓ Remove battery and display before basic cleaning.

### 7.2.1 Cleaning the frame

- ▶ Soak dirt stains on the frame with dish-washing detergent if the dirt is thick and ingrained.
- ▶ After leaving it to soak for a time, remove the dirt and mud with a sponge, brush and toothbrush.
- ▶ Use a watering can or your hand to rinse the frame to finish off.
- ▶ Service the frame after cleaning.

### 7.2.2 Cleaning the stem

- ▶ Clean stem with a cloth and soapy water.
- ▶ Service the stem after cleaning.

### 7.2.3 Cleaning the rear frame damper

- ▶ Clean rear frame damper with a cloth and soapy water.

### 7.2.4 Cleaning the wheel



### WARNING

#### Crash caused by braking hard on rims

A rim can break and block the wheel if you brake hard. This may cause a crash with serious injuries.

Check rim *wear* on a regular basis.

- ▶ Check the tyres, rims, spokes and spoke nipples for any damage when cleaning the wheel.
- ▶ Use a sponge and a brush to clean the hub and spokes from the inside to the outside.
- ▶ Clean the rim with a sponge.

### 7.2.5 Cleaning the drive elements

- ▶ Spray the cassette, the chain wheels and the front derailleur with a degreasing agent.
- ▶ Clean coarse dirt with a brush after soaking for a short time.
- ▶ Wash down all parts with dish-washing detergent and a toothbrush.
- ▶ Service the drive elements after cleaning.

### 7.2.6 Cleaning the chain

#### Notice

- ▶ Never use aggressive (acid-based) cleaners, rust removers or degreasers when cleaning the chain.
  - ▶ Do not use chain cleaning devices or chain cleaning baths.
- 
- ▶ Slightly dampen a brush with dish-washing liquid. Brush both sides of the chain.
  - ▶ Dampen a cloth with soapy water. Place the cloth on the chain.
  - ▶ Hold and apply slight pressure while slowly turning the rear wheel, so the chain passes through the cloth.
  - ▶ If the chain is still dirty afterwards, clean it with lubricant.
  - ▶ Service the chain after cleaning.

### 7.2.7 Cleaning the battery



**CAUTION**

#### Risk of fire and explosion due to penetration by water

The battery is only protected from simple spray water. Penetration by water can cause a short circuit. The battery may self-ignite and explode.

- ▶ Never clean the battery with a high-pressure water device, water jet or compressed air.
- ▶ Keep the contacts clean and dry.
- ▶ Never immerse the battery in water.
- ▶ Never use cleaning agents.
- ▶ Remove the battery from the pedelec before cleaning.

#### Notice

- ▶ Do not clean the battery with solvents, such as thinners, alcohol, oil and corrosion protection, or with cleaning agents.
- 
- ▶ Clean the battery electrical connections with a dry cloth or brush only.
  - ▶ Wipe off the decorative sides with a damp cloth.

### 7.2.8 Cleaning the display

#### Notice

If water enters into the display screen, it will be permanently damaged.

- ▶ Never immerse the display in water.
  - ▶ Never clean with a high-pressure water device, water jet or compressed air.
  - ▶ Never use cleaning agents.
  - ▶ Remove the display from the pedelec before cleaning.
- 
- ▶ Carefully clean the display with a damp, soft cloth.

### 7.2.9 Cleaning the drive unit



**CAUTION**

#### Burns from hot drive

The drive cooler can become extremely hot during use. Contact may cause burns.

- ▶ Leave the drive unit to cool before cleaning.



## Notice

If water enters into the drive unit, the unit will be permanently damaged.

- ▶ Never immerse the drive unit in water.
  - ▶ Never clean with a high-pressure water device, water jet or compressed air.
  - ▶ Never use cleaning agents.
  - ▶ Never open.
- 
- ▶ Carefully clean the drive unit with a damp, soft cloth.

### 7.2.10 Cleaning the brake



#### WARNING

#### Brake failure due to water penetration

The brake seals are unable to withstand high pressures. Damaged brakes can fail and cause an accident with injury.

- ▶ Never clean the pedelec with compressed air or a high-pressure water device.
  - ▶ Take great care when using a hosepipe. Never point the water jet directly at the seal section.
- 
- ▶ Clean brake and brake discs with a brush, water and dish-washing detergent.
  - ▶ Clean brake discs thoroughly with brake cleaner or spirit.

## 7.3 Servicing

### Required tools and cleaning agents:

- Cloths
- Toothbrushes
- Dish-washing liquid
- Care oil for frames
- Silicone or Teflon oil
- Acid-free lubricating grease
- Fork oil
- Chain oil
- Degreaser
- Spray oil
- Teflon spray

### 7.3.1 Servicing the frame

- ▶ Dry frame after cleaning.
- ▶ Spray with care oil. Clean off the care oil again after a short time.

### 7.3.2 Servicing the stem

- ▶ Apply silicone or Teflon oil to the stem shaft tube and the quick release lever pivot point.
- ▶ If you have speedlifter Twist, also apply oil to the unlocking bolt using the groove in the speedlifter body.
- ▶ Apply a little acid-free lubricant grease between the stem quick release lever and the sliding piece to reduce the quick release lever operating force.

### 7.3.3 Servicing the fork

- ▶ Treat the dust seals with fork oil.

### 7.3.4 Servicing the drive elements

- ▶ Spray the cassette, the chain wheels and the front derailleur with a degreasing agent.
- ▶ Clean coarse dirt with a brush after soaking for a short time.
- ▶ Wash down all parts with dish-washing detergent and a toothbrush.

### 7.3.5 Servicing the pedals

- ▶ Treat with spray oil after cleaning.

### 7.3.6 Servicing the chain

- ▶ Grease the chain thoroughly with chain oil after cleaning.

### 7.3.7 Servicing the drive elements

- ▶ Service front and rear derailleur articulated shafts and jockey wheels with Teflon spray.

## 7.4 Maintenance

### CAUTION

#### Crash and falling caused by unintentional activation

There is a risk of injury if the drive system is activated unintentionally.

- ▶ Remove the battery before maintenance.

The following maintenance measures must be performed on a regular basis. They can be carried out by the operator and rider. In case of any doubt, consult the specialist dealer.

### 7.4.1 Wheel

### WARNING

#### Crash caused by braking hard on rims

A rim can break and block the wheel if you brake hard. This may cause a crash with serious injuries.

- ▶ Check *rim wear* on a regular basis.

### Notice

If the tyre pressure is too low in the tyre, the tyre does not achieve its load bearing capacity. The tyre is not stable and may come off the rim.

If the tyre pressure is too high, the tyre may burst.

- ▶ Check the tyre pressure as per specifications
- ▶ *Adjust the tyre pressure* as necessary.

- ▶ Check *tyre wear*.
- ▶ Check the *tyre pressure*.
- ▶ Check the *rims* for wear.
  - The rims of a rim brake with invisible wear indicator are worn as soon as the wear indicator becomes visible in the area of the rim joint.
  - The rims with visible wear indicator are worn as soon as the black, all-round groove on the pad friction surface is no longer visible. We recommend that you also replace the *rims* with every second brake lining replacement.
- ▶ Check the tension of the spokes.

## 7.4.2 Checking the tyres

- ▶ Check the tyre wear. The tyre is worn if the anti-puncture protection or the carcass cords are visible.
- ⇒ A specialist dealer will need to change the tyre if it is worn.

## 7.4.3 Checking the rims

- ▶ Check the *rims* for wear. The rims are worn as soon as the black, all-round groove on the pad friction surface becomes invisible.
- ⇒ Worn rims must be replaced by a specialist dealer.
- ⇒ We recommend that you also replace the *rims* at the same time as every second brake lining replacement.

## 7.4.4 Check and correct tyre pressure

### 7.4.4.1 Dunlop valve



The tyre pressure cannot be measured on the simple Dunlop valve. The tyre pressure is therefore measured in the filling hose when pumping slowly with the bicycle pump.

It is recommendable to use a bicycle pump with a pressure gauge. The operating instructions for the bicycle pump must be adhered to.

- ▶ Unscrew and remove the valve cap.
- ▶ Connect the bicycle pump.
- ▶ Pump up the tyre slowly and pay attention to the tyre pressure in the process.
- ▶ Correct the tyre pressure according to specifications in the Bike pass.
- ▶ If the tyre pressure is too high, unfasten the union nut, let out air and tighten the union nut again.
- ▶ Remove the bicycle pump.
- ▶ Screw the valve cap tight.

- ▶ Screw the rim nut gently against the rim with the tips of your fingers.

### 7.4.4.2 Presta valve

- ✓ It is recommendable to use a bicycle pump with a pressure gauge. The operating instructions for the bicycle pump must be observed.



- ▶ Unscrew and remove the valve cap.
- ▶ Open the knurled nut around four turns.
- ▶ Carefully apply the bicycle pump so that the valve insert is not bent.
- ▶ Pump up the tyre slowly and pay attention to the tyre pressure in the process.

- ⇒ The tyre pressure has been adjusted as per the specifications.

- ▶ Remove the bicycle pump.
- ▶ Tighten the knurled nut with your fingers.
- ▶ Screw the valve cap tight.

Screw the rim nut gently against the rim with the tips of your fingers.

### 7.4.4.3 Schrader valve

- ✓ It is recommendable to use a bicycle pump with a pressure gauge. The operating instructions for the bicycle pump must be adhered to.

- ▶ Unscrew and remove the valve cap.
- ▶ Connect the bicycle pump.

- ▶ Pump up the tyre slowly and pay attention to the tyre pressure in the process.

- ⇒ The tyre pressure has been adjusted as per the specifications.

- ▶ Remove the bicycle pump.

- ▶ Screw the valve cap tight.

- ▶ Screw the rim nut gently against the rim with the tips of your fingers.



### 7.4.5 Brake system



#### Crash caused by brake failure

Worn brake discs and brake linings, as well as a lack of hydraulic fluid in the brake cable, reduce the braking power. This may cause a crash with injuries.

- ▶ Check the brake disc, brake linings and the hydraulic brake system on a regular basis and replace if necessary.

The maintenance interval for the brake depends on the weather conditions and how frequent the pedelec is used. If the pedelec is used under extreme conditions such as rain, dirt or high mileage, maintenance must be performed more frequently.

### 7.4.6 Checking the brake linings for wear

Check brake linings after brake has been fully applied 1,000 times.

- ▶ Check that the brake linings are no less than 1.8 mm wide at any point and no less than 2.5 mm between the brake lining and supporting plate.
  - ▶ Push brake lever and hold. In doing so, check the transport safety wear gauge can fit between the brake lining supporting plates.
- ⇒ The brake linings have not reached their wear limit. If they have, a specialist dealer will need to replace the brake linings.

### 7.4.7 Checking the pressure point

- ▶ Push brake lever and hold several times.
- ⇒ If you are unable to clearly detect the pressure point and it changes, a ZEG specialist dealer needs to vent the brake.

### 7.4.8 Checking the brake discs for wear

- ▶ Check that the brake disc is no less than 1.8 mm at any point.
- ⇒ The brake discs have not reached the wear limit. If they have, a specialist dealer will need to replace brake discs.

### 7.4.9 Electrical cables and brake cables

- ▶ Check all visible electrical cables and cables for damage. If the sheathing is compressed, for example, the pedelec will need to be removed from service until the cables have been replaced.
- ▶ Check all electrical cables and cables to make sure they are fully functional.

### 7.4.10 Gear shift

- ▶ Check the gear shift and the *shifter* or the *twist grip* setting and adjust it as necessary.

### 7.4.11 Stem

- ▶ The stem and quick release system should be inspected at regular intervals. The specialist dealer should adjust them if necessary.
- ▶ If the hexagon socket head screw is also loosened, the headset backlash also needs to be adjusted. Medium-strength thread locker, such as Loctite blue, then needs to be applied to the loosened screws and the screws tightened as per specifications.
- ▶ Check for wear and signs of corrosion (maintain with an oily cloth) and for oil leaks.

### 7.4.12 USB port

#### Notice

Any moisture which enters through the USB port may trigger a short circuit in the *display*.

- ▶ Regularly check the position of the *cover on the USB port* and adjust it as necessary.

### 7.4.13 Checking the chain tension

#### Notice

Excessive chain tension increases wear.

If the chain tension is too low, there is a risk that the *chain* or the *drive belt* will slip off the *chain wheels*.

- ▶ Check the chain tension once a month.
- 
- ▶ Check the chain tension in three or four positions, turning the crank a full revolution.
  - ▶ If the *chain* can be pushed more than 2 cm, the *chain* or *drive belt* will need to be tensioned again by the specialist dealer.
  - ▶ If the *chain* or the *drive belt* can only be pushed up and down less than 1 cm, you will need to slacken the *chain* or the *drive belt*.
- ⇒ The optimum chain tension is achieved if the *chain* or the *drive belt* can be pushed a maximum of 2 cm in the middle between the pinion and the toothed wheel. The crank must also turn without resistance.
- ⇒ If a hub gear is featured, the rear wheel must be pushed backwards or forwards to tighten the chain. This should be done by a specialist only.

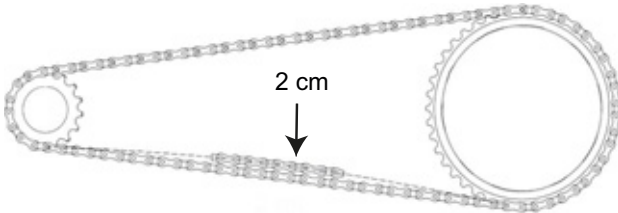


Figure 87: Checking the chain tension

### 7.4.14 Checking the handlebar grip position

- ▶ Check the handlebar grip is firmly in position.



## 8 Maintenance

### WARNING

#### Injury due to damaged brakes

Special tools and specialist knowledge are required to repair the brakes. Incorrect or unauthorised assembly can damage the brakes. This may lead to an accident with injuries.

- ▶ Only specialist dealers may carry out repairs on brakes.

Never carry out work or changes (such as dismantling, sanding or painting) which are not explicitly allowed and described in the brake user manual.

#### Injury to the eyes

Problems may arise if the settings are not made properly and you may sustain serious injuries as a result.

Always wear safety glasses to protect your eyes when carrying out maintenance work such as replacing components.

### CAUTION

#### Crash and falling caused by unintentional activation

There is a risk of injury if the drive system is activated unintentionally.

- ▶ Remove the battery before inspection.

#### Crash caused by material fatigue

If the service life of a component has expired, the component may suddenly fail. This may cause a crash with injuries.

- ▶ Have the specialist dealer carry out basic cleaning of the pedelec every six months, preferably at the same time as the required servicing work.

### CAUTION

#### Hazard for the environment due to toxic substances

The brake system contains toxic and environmentally harmful oils and lubricants. Such fluids will contaminate if they enter the sewers or groundwater.

- ▶ Dispose of lubricants and oils left over after repairs in an environmentally responsible way
- ▶ in accordance with statutory regulations.

### Notice

The motor is maintenance-free and may only be opened by qualified specialist personnel.

- ▶ Never open the motor.

You must have the specialist dealer perform maintenance every six months as a minimum. This is the only way to ensure that the pedelec remains safe and fully functional.

Special tools, special lubricants and knowledge of suspension components are required to maintain and repair brake discs as well as vent brakes or replace brake discs. The pedelec may become damaged if the stipulated maintenance intervals and procedures are not carried out. That is why only specialist dealers may carry out maintenance.

- ▶ The retailer will check the pedelec based on the maintenance table in the appendix.
- ▶ The specialist dealer will inspect the pedelec for any signs of material fatigue during basic cleaning.
- ▶ The specialist dealer will check the software version of the drive system and update it. The electrical connections are checked, cleaned and preservative agent is applied. The electrical cables are inspected for damage.
- ▶ The specialist dealer will dismantle and clean the entire suspension fork interior and exterior. They will clean and lubricate the dust seals and slide bushings, check the torques and adjust the fork to the rider's preferred position. They will also replace the sliding collar if the clearance is too great (more than 1 mm on the fork bridge).

- ▶ The specialist dealer will fully inspect the interior and exterior of the rear frame damper, overhaul the rear frame damper, replace all air seals on air forks, overhaul the air suspension, change the oil and replace the dust wipers.
- ▶ They will pay particular attention to rim and brake wear. The spokes are re-tightened in accordance with the findings.

## 8.1 Axle with quick release



### Crash caused by unfastened quick release

A faulty or incorrectly installed quick release may become caught in the brake disc and block the wheel. This will cause a crash.

- ▶ Install the front wheel quick release lever on the opposite side to the brake disc.

### Crash caused by faulty or incorrectly installed quick release

The brake disc becomes very hot during operation. Parts of the quick release may become damaged as a result. The quick release comes loose. This will cause a crash with injuries.

- ▶ The front wheel quick release lever and the brake disc must be situated on opposite sides.

### Crash caused by incorrectly set clamping force

Excessively high clamping force will damage the quick release and cause it to lose its function.

Insufficient clamping force will cause a detrimental transmission of force. The suspension fork or the frame may break. This will cause a crash with injuries.

- ▶ Never fasten a quick release using a tool (e.g. hammer or pliers).

Only use the clamping lever with the specified set clamping force.

## 8.1.1 Checking the quick release

- ▶ Check the position and clamping force of the quick release lever. The quick release lever must be flush with the lower housing. You must be able to see a slight impression on the palm of your hand when you close the quick release lever.



Figure 88: Adjusting the quick release clamping force

- ▶ Use a 4 mm hexagon socket spanner to adjust the clamping lever clamping force if required. Afterwards, check the quick release lever position and clamping force.

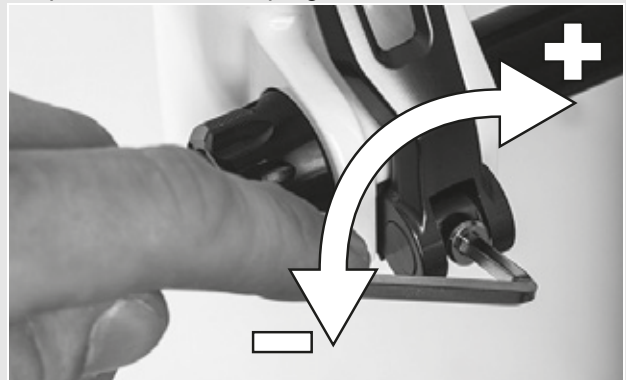


Figure 89: Adjusting the quick release clamping force

## 8.2 Adjusting the gear shift

If you cannot select the gears effortlessly, you will need to adjust the setting for the shift cable tension.

- ▶ Carefully pull the *adjusting sleeve* away from the shifter housing, turning it as you do so.
- ▶ Check the gear shift function after each adjustment.

### 8.2.1 Cable-operated gear shift, single-cable

Only applies to pedelecs with this equipment

- For a smooth gear shift, adjust the adjusting sleeves on the shifter housing.



Figure 90: Adjusting sleeve (1) for the single-cable, cable-operated gear shift with shifter housing (2), example

### 8.2.2 Cable-operated gear shift, dual-cable

Only applies to pedelecs with this equipment

- For a smooth gear shift, set the adjusting sleeves underneath the chain stay on the frame.
- The shift cable has around 1 mm play when it is pulled out gently.

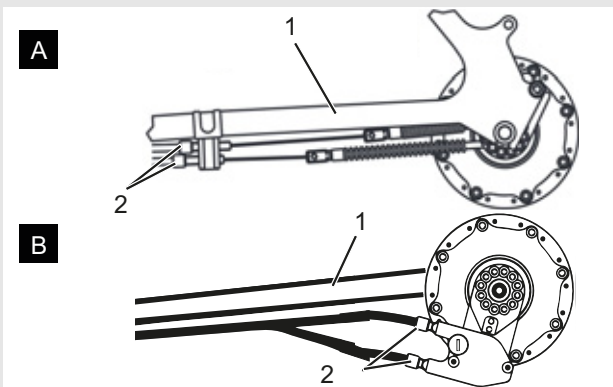


Figure 91: Adjusting sleeves (2) on two alternative versions (A and B) of a dual-cable, cable-operated gear shift on the chain stay (1)

### 8.2.3 Cable-operated twist grip, dual-cable

Only applies to pedelecs with this equipment

- For a smooth gear shift, set the adjusting sleeves on the shifter housing.
- ⇒ There is noticeable play of around 2–5 mm (1/2 gear) when twisting the twist grip.

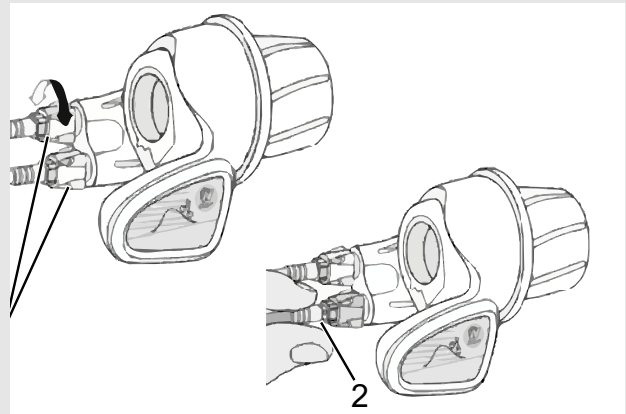


Figure 92: Twist grip with adjusting sleeves (1) and play of the gear shift (2)



## 9 Troubleshooting, fault clearance and repair

### 9.1 Troubleshooting and fault clearance



#### Risk of fire and explosion due to faulty battery

The safety electronics may fail if the battery is damaged or faulty. The residual voltage can cause a short circuit. Batteries may self-ignite and explode.

- ▶ Batteries with external damage must be removed from service immediately.
- ▶ Never allow damaged batteries to come into contact with water.
- ▶ If a battery is dropped or struck but shows no signs of external damage, remove it from service and observe it for at least 24 hours.
- ▶ Faulty batteries are hazardous goods. Dispose of faulty batteries properly and as quickly as possible.
- ▶ Store in a dry place until disposal. Never store in the vicinity of flammable substances.

Never open or repair the battery.

The components of the drive system are checked constantly and automatically. If an error is detected the corresponding error code will appear on the *display screen*. Depending on the type of error, the drive will also be automatically switched off.

#### 9.1.1 The drive system or display do not start up

If the display and/or the drive system do not start up, proceed as follows:

- ▶ Check whether the battery is switched on. If not, start the battery.
- ⇒ Contact specialist dealer if the battery level indicator LEDs do not light up.
- ▶ If the LEDs on the battery level indicator light up, but the drive system does not start up, remove the battery.

- ▶ Insert the battery.
- ▶ Start the drive system.
- ▶ If the drive system does not start up, remove the battery.
- ▶ Clean all the contacts with a soft cloth.
- ▶ Insert the battery.
- ▶ Start the drive system.
- ▶ If the drive system does not start up, remove the battery.
- ▶ Fully charge the battery.
- ▶ Insert the battery.
- ▶ Start the drive system.
- ▶ If the drive system does not start up, remove the display.
- ▶ Fasten the display.
- ▶ Start the drive system.
- ▶ Contact your specialist dealer if the drive system does not start up.

#### 9.1.2 Error messages

If an error message is displayed, run through the following actions:

- ▶ Make a note of the system message.
- ▶ Shut off and re-start the drive system.
- ▶ If the system message is still displayed, remove and then re-insert the battery.
- ▶ Re-start the drive system.
- ▶ If the system message is still displayed, contact your specialist dealer.

## 9.2 Repair

Special knowledge and tools are required for many repairs. That is why only a specialist dealer may perform repairs such as:

- Replacing tyres and rims
- Replacing brake pads and brake linings
- Replacing and tensioning the chain.

### 9.2.1 Use original parts and lubricants only

The individual pedelec parts have been carefully selected and matched to one other.

Only original parts and lubricants must be used for maintenance and repair.

The constantly updated accessory approval and parts list are Section 11, Documents and Drawings.

### 9.2.2 Replacing the lighting

- ▶ Only use components of the respective power class for replacement.

### 9.2.3 Setting the headlight

- ▶ The *headlight* must be set, so that its light beam shines on the road 10 m in front of the pedelec.

## 10 Recycling and disposal

### WARNING

#### Risk of fire and explosion

The safety electronics on a damaged or faulty battery may fail. The residual voltage can cause a short circuit. The battery may self-ignite and explode.

- ▶ Remove battery with any external damage from service immediately and never recharge it.
- ▶ If the battery becomes deformed or begins to smoke, keep at a safe distance, disconnect the power supply at the socket, and notify the fire service immediately.
- ▶ Never extinguish damaged batteries with water or allow them to come into contact with water.
- ▶ Faulty batteries are hazardous goods. Dispose of faulty batteries properly as quickly as possible.
- ▶ Store in a dry place until disposal. Never store in the vicinity of flammable substances.

Never open or repair the battery.

### CAUTION

#### Chemical burns to the skin and eyes

Liquids and vapours may leak from a damaged or faulty battery. They can irritate the airways and cause burns.

- ▶ Avoid contact with leaked liquids.
- ▶ Immediately consult a doctor in case of contact with the eyes or any discomfort.
- ▶ In case of contact with the skin, rinse off immediately with water.
- ▶ Ventilate the room well.

### CAUTION

#### Hazard for the environment

The fork, rear frame damper and hydraulic brake system contain toxic and environmentally harmful oils and lubricants. Such fluids will contaminate if they enter the sewers or groundwater.

- ▶ Dispose of lubricants and oils in an environmentally responsible way in accordance with statutory regulations.



This device is marked according to the European Directive 2012/19/EU on waste electrical and electronic equipment – WEEE and the European Directive 2006/66/EC on accumulators. The directive provides the framework for the return and recycling of used devices



across the EU. As a consumer, you are legally required to return all used batteries of any type. It is forbidden to dispose of batteries in domestic waste. The manufacturer is obliged to take back used and old batteries free of charge as per Section 9 German Battery Act. You thus meet statutory obligations and help to protect the environment. The pedelec, battery, motor, display screen and charger are recyclable materials. You must dispose of and recycle them separately from the domestic waste in compliance with applicable statutory regulations. Sorted waste collection and recycling saves on raw material reserves and ensures that all the regulations for health and environmental protection are met when the product and/or the battery are recycled.

- ▶ Never dismantle the pedelec, batteries or charger for disposal.
- ▶ The pedelec, display screen, the unopened and undamaged battery and the charger can be returned to any specialist dealer free of charge. Depending on the region, further disposal options may be available.

Store the individual parts of the decommissioned pedelec in a dry place, free from frost, where they are protected from direct sunlight.

## 11 Documents

### 11.1 Parts list

There was no information relating to a parts list yet at the time of going to press. You'll find the information in the latest *operating instructions*.

## 11.2 Assembly report

Date:

Frame number:

Components	Description		Criteria		Measures if rejected
	Assembly/inspection	Tests	Acceptance	Rejection	
<b>Front wheel</b>	Assembly		O.K.	Loose	Adjust quick release
<b>Kickstand</b>	Check mount fastening	Functional check	O.K.	Loose	Retighten screws
<b>Tyres</b>		Tyre pressure check	O.K.	Tyre pressure too low/too high	Adjust tyre pressure
<b>Frame</b>	Check for damage – fracture, scratches		O.K.	Damage detected	<i>Take out of operation</i> , new frame
<b>Handles, coverings</b>	Check mount fastening		O.K.	Not provided	Retighten screws, new handles or coverings as specified in parts list
<b>Handlebars, stem</b>	Check mount fastening		O.K.	Loose	Retighten screws; new stem as specified in parts list if necessary
<b>Steering headset</b>	Check for damage	Functional check	O.K.	Loose	Retighten screws
<b>Saddle</b>	Check mount fastening		O.K.	Loose	Retighten screws
<b>Seat post</b>	Check mount fastening		O.K.	Loose	Retighten screws
<b>Protective plate</b>	Check mount fastening		O.K.	Loose	Retighten screws
<b>Pannier rack</b>	Check mount fastening		O.K.	Loose	Retighten screws
<b>Attachments</b>	Check mount fastening		O.K.	Loose	Retighten screws
<b>Bell</b>		Functional check	O.K.	No ring, too quiet, missing	New bell as specified in the parts list
<b>Suspension elements</b>					
<b>Fork, suspension fork</b>	Check for damage		O.K.	Damage detected	New fork as specified in the parts list
<b>Rear frame damper</b>	Check for damage		O.K.	Damage detected	New fork as specified in the parts list
<b>Suspension seat post</b>	Check for damage		O.K.	Damage detected	New fork as specified in the parts list
<b>Brake system</b>					
<b>Brake lever</b>	Check mount fastening		O.K.	Loose	Retighten screws
<b>Brake fluid</b>	Check fluid level		O.K.	Too little	Refill with brake fluid; new brake hoses if damaged
<b>Brake linings</b>	Check brake linings, brake discs or rims for damage		O.K.	Damage detected	New brake linings, brake discs or rims
<b>Back-pedal brake braking armature</b>	Check mount fastening		O.K.	Loose	Retighten screws
<b>Light system</b>					
<b>Rechargeable battery</b>	First examination		O.K.	Error message	<i>Take out of service</i> ; contact battery manufacturer, new battery
<b>Light cabling</b>	Connections, correct wiring		O.K.	Cable defective, no light	New cabling
<b>Rear light</b>	Side light	Functional check	O.K.	No constant light	<i>Take out of service</i> ; new rear light as specified in parts list; replace battery if necessary
<b>Front light</b>	Side light, daytime riding light	Functional check	O.K.	No constant light	<i>Take out of service</i> ; new front light as specified in parts list; replace battery if necessary
<b>Reflectors</b>	All complete, state, fastening		O.K.	Damaged or not all complete	New reflectors
<b>Drive/gear shift</b>					
<b>Chain/cassette/pinion/chainring</b>	Check for damage		O.K.	Damage	Refasten if necessary or replace as specified in parts list

Components	Description		Criteria	Measures if rejected	
<b>Chain guard/spoke guard</b>	Check for damage		O.K.	Damage	Replace as specified in parts list
<b>Bottom bracket axle/crank</b>	Check mount fastening		O.K.	Loose	Retighten screws
<b>Pedals</b>	Check mount fastening		O.K.	Loose	Retighten screws
<b>Shifter</b>	Check mount fastening	Functional check	O.K.	Loose	Retighten screws
<b>Shift cables</b>	Check for damage	Functional check	O.K.	Loose or defective	Adjust shift cables; new shift cables if necessary
<b>Front derailleur</b>	Check for damage	Functional check	O.K.	Gear shift difficult or not possible	Adjust
<b>Rear derailleur</b>	Check for damage	Functional check	O.K.	Gear shift difficult or not possible	Adjust
<b>Electric drive</b>					
<b>Display</b>	Check for damage	Functional check	O.K.	No screen display, defective screen display	Restart, test battery, new software, or new display; <i>take out of service</i> ,
<b>Electric drive control panel</b>	Check drive for damage	Functional check	O.K.	No response	Restart; contact control panel manufacturer, new control panel
<b>Tachometer</b>		Speed measurement	O.K.	Pedelec travelling 10% too fast/slow	Shut off pedelec until source of fault is found
<b>Cabling</b>	Visual inspection		O.K.	Failure in system, damage, kinked cables	New cabling
<b>Battery mount</b>	Firmly in position, lock, contacts	Functional check	O.K.	Loose; lock doesn't close, no contacts	New battery mount
<b>Motor</b>	Visual inspection and mount		O.K.	Damage, loose	Refasten motor, contact motor manufacturer, new motor
<b>Software</b>	Check version		In latest version	Not latest version	Import update

### Technical inspection, checking safety, test ride

Components	Description		Criteria		Measures if rejected
	Assembly/inspection	Tests	Acceptance	Rejection	
<b>Brake system</b>		Functional check	O.K.	No full braking; braking distance too long	Locate defective part in brake system and correct
<b>Gear shift under operating load</b>		Functional check	O.K.	Problems when shifting gear	Readjust gear shift
<b>Suspension components (fork, shock absorber, seat post)</b>		Functional check	O.K.	Suspension too deep or no longer exists	Locate defective component and correct
<b>Electric drive</b>		Functional check	O.K.	Loose connection, problems when riding, accelerate	Locate defective part in electric drive and correct
<b>Light system</b>		Functional check	O.K.	No continuous light, too bright	Locate defective part in light system and correct
<b>Test ride</b>			No strange noises.	Strange noises.	Locate source of noise and correct

<b>Date</b>	
<b>Fitter's name:</b>	
<b>Final inspection by workshop manager</b>	

## 11.3 Maintenance log

### Diagnosis and documentation of current status

Date:

Frame number:

Components	Frequency	Description			Criteria		Measures if rejected
		Inspection	Tests	Maintenance	Acceptance	Rejection	
Front wheel	6 months	Assembly			O.K.	Loose	Adjust quick release
Kickstand	6 months	Check mount fastening	Functional check		O.K.	Loose	Retighten screws
Tyres	6 months		Tyre pressure check		O.K.	Tyre pressure too low/too high	Adjust tyre pressure
Frame	6 months	Check for damage – fracture, scratches			O.K.	Damage detected	Shut off pedelec; new frame
Handles, coverings	6 months	Wear; check if fastened securely			O.K.	Not provided	Retighten screws, new handles or coverings as specified in parts list
Handlebars, stem	6 months	Check mount fastening			O.K.	Loose	Retighten screws; new stem as specified in parts list if necessary
Steering headset	6 months	Check for damage	Functional check	Lubricating and adjustment	O.K.	Loose	Retighten screws
Saddle	6 months	Check mount fastening			O.K.	Loose	Retighten screws
Seat post	6 months	Check mount fastening			O.K.	Loose	Retighten screws
Protective plate	6 months	Check mount fastening			O.K.	Loose	Retighten screws
Pannier rack	6 months	Check mount fastening			O.K.	Loose	Retighten screws
Attachments	6 months	Check mount fastening			O.K.	Loose	Retighten screws
Bell	6 months		Functional check		O.K.	No ring, too quiet, missing	New bell as specified in the parts list
<b>Suspension elements</b>							
Fork, suspension fork	To manufacturer's specifications	Check for damage – corrosion, fracture		Maintenance as specified by manufacturer Lubrication, oil change as specified by manufacturer	O.K.	Damage detected	New fork as specified in the parts list
Rear frame damper	To manufacturer's specifications	Check for damage – corrosion, fracture		Maintenance as specified by manufacturer Lubrication, oil change as specified by manufacturer	O.K.	Damage detected	New fork as specified in the parts list
Suspension seat post	To manufacturer's specifications	Check for damage		Maintenance as specified by manufacturer	O.K.	Damage detected	New fork as specified in the parts list
<b>Brake system</b>							
Brake lever	6 months	Check mount fastening			O.K.	Loose	Retighten screws
Brake fluid	6 months	Check fluid level		Depending on time of year	O.K.	Too little	Top up brake fluid; <i>take out of service</i> if damaged; new brake hoses
Brake linings	6 months	Check brake linings, brake discs or rims for damage			O.K.	Damage detected	New brake linings, brake discs or rims
Back-pedal brake braking armature	6 months	Check mount fastening			O.K.	Loose	Retighten screws
Brake system	6 months	Check mount fastening		Functional check	O.K.	Loose	Retighten screws

Components	Frequency	Description			Criteria		Measures if rejected
		Inspection	Tests	Maintenance	Acceptance	Rejection	
<b>Light system</b>							
<b>Rechargeable battery</b>		First examination			O.K.	Error message	Contact battery manufacturer; <i>take out of service</i> , new battery
<b>Light cabling</b>		Connections, correct wiring			O.K.	Cable defective, no light	New cabling
<b>Rear light</b>		Side light	Functional check		O.K.	No constant light	New rear light as specified in parts list; replace battery if necessary
<b>Front light</b>		Side light, daytime riding light	Functional check		O.K.	No constant light	New front light as specified in parts list; replace battery if necessary
<b>Reflectors</b>		All complete, state, fastening			O.K.	Damaged or not all complete	New reflectors
<b>Drive/gear shift</b>							
<b>Chain/cassette/pinion/chainring</b>		Check for damage			O.K.	Damage	Refasten if necessary or replace as specified in parts list
<b>Chain guard/spoke guard</b>		Check for damage			O.K.	Damage	Replace as specified in parts list
<b>Bottom bracket axle/crank</b>		Check mount fastening			O.K.	Loose	Retighten screws
<b>Pedals</b>		Check mount fastening			O.K.	Loose	Retighten screws
<b>Shifter</b>		Check mount fastening	Functional check		O.K.	Loose	Retighten screws
<b>Shift cables</b>		Check for damage	Functional check		O.K.	Loose or defective	Adjust shift cables; new shift cables if necessary
<b>Front derailleur</b>		Check for damage	Functional check		O.K.	Gear shift difficult or not possible	Adjust
<b>Rear derailleur</b>		Check for damage	Functional check		O.K.	Gear shift difficult or not possible	Adjust
<b>Electric drive</b>							
<b>Display</b>		Check for damage	Functional check		O.K.	No screen display, defective screen display	Restart, test battery, new software, or new display; <i>take out of service</i> ,
<b>Electric drive control panel</b>		Check drive for damage	Functional check		O.K.	No response	Restart; contact control panel manufacturer, new control panel
<b>Tachometer</b>			Speed measurement		O.K.	Pedelec travelling 10% too fast/slow	Shut off pedelec until source of fault is found
<b>Cabling</b>		Visual inspection			O.K.	Failure in system, damage, kinked cables	New cabling
<b>Battery mount</b>		Firmly in position, lock, contacts	Functional check		O.K.	Loose; lock doesn't close, no contacts	New battery mount
<b>Motor</b>		Visual inspection and mount			O.K.	Damage, loose	Refasten motor, contact motor manufacturer, new motor; <i>take out of service</i>
<b>Software</b>		Check version			In latest version	Not latest version	Import update



### Technical inspection, checking safety, test ride

Components	Description	Criteria		Measures if rejected	
Assembly/inspection	Tests	Accept- ance	Rejection		
<b>Brake system</b>		Functional check	O.K.	No full braking; braking distance too long	Locate defective part in brake system and correct
<b>Gear shift under operating load</b>		Functional check	O.K.	Problems when shifting gear	Readjust gear shift
<b>Suspension components (fork, shock absorber, seat post)</b>		Functional check	O.K.	Suspension too deep or no longer exists	Locate defective component and correct
<b>Electric drive</b>		Functional check	O.K.	Loose connection, problems when riding, accelerate	Locate defective part in electric drive and correct
<b>Light system</b>		Functional check	O.K.	No continuous light, too bright	Locate defective part in light system and correct
<b>Test ride</b>			No strange noises.	Strange noises.	Locate source of noise and correct

Date	
Fitter's name:	
Final inspection by workshop manager	

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## 13 Glossary

### Wear

Source: DIN 31051: reduction in useful life (4.3.4), caused by chemical and/or physical processes.

### Shut-off speed

Source: EN 15194:2017: speed reached, by the pedelec, at the moment the current has dropped to zero or to the no load current value.

### Drive belt

Source: EN 15194:2017: seamless ring belt which is used as a means of transmitting motive force.

### Work environment

Source: EN ISO 9000:2015: set of conditions under which work is performed.

### Decommissioning

Source: DIN 31051: intentional, unlimited interruption in an object's functional capability.

### Year of manufacture

Source: ZEG: the year of manufacture is the year in which the pedelec was manufactured. The production period is always from August to July of the following year.

### Instruction handbook

Source: ISO/DIS 20607:2018: part of the user information that machine manufacturers provide to machine operators; it contains guidance, instructions and tips related to the use of the machine in all its life cycle phases

### Brake lever

Source: EN 15194:2017: lever used to apply the brake

### Braking distance

Source: EN 15194:2017: distance travelled by a pedelec between the commencement of braking and the point at which the pedelec comes to rest

### Fracture

Source: EN 15194:2017: unintentional separation into two or more parts

### CE marking

Source: Directive 2006/42/EC on Machinery: the manufacturer uses the CE marking to declare that the pedelec complies with the applicable requirements.

### City and trekking bicycles

Source: EN-ISO 4210 - 2: pedelec designed for use on public roads primarily for means of transportation or leisure.

### Electrical control system

Source: EN 15194:2017: electronic and/or electrical component, or an assembly of components provided for installation into a vehicle, together with all electrical connections and associated wiring for the motor electrical power assistance

### Electrically power assisted cycle, pedelec

Source: EN 15194:2017: electrically power assisted cycle, equipped with pedals and an auxiliary electric motor, which cannot be propelled exclusively by means of the auxiliary electric motor, except in start-up assistance mode

### Spare part

Source: EN 13306:2018-02, 3.5: item intended to replace a corresponding item in order to retain or maintain the original required function of the item

### Folding bicycle

Source: EN-ISO 4210-2: bicycle designed to fold into a compact form, facilitating transport and storage.

### Fault

Source: EN 13306:2018-02, 6.1: state of an item (4.2.1) characterized by inability to perform a required function (4.5.1), excluding the inability during preventive maintenance or other planned actions, or due to lack of external resources

**Fork steerer**

*Source: EN 15194:2017:* part of a fork that rotates about the steering axis of a bicycle frame head tube. It is normally connected to the fork crown or directly to the fork legs, and is normally the point of connection between the fork and the handlebar stem.

**Suspension fork**

*Source: EN 15194:2017:* front fork incorporating controlled, axial flexibility to reduce the transmission of road-shocks to the rider

**Suspension frame**

*Source: EN 15194:2017:* frame incorporating controlled, vertical flexibility to reduce the transmission of road-shocks to the rider

**Mountain bike**

*Source: EN-ISO 4210-2:* bicycle designed for use off-road on rough terrain, on public roads, and on public pathways, equipped with a suitably strengthened frame and other components, and, typically, with wide-section tyres with coarse tread patterns and a wide range of transmission gears.

**Weight of ready-to-ride bicycle**

*Source: ZEG:* the indicated weight for a ready-to-ride bicycle refers to the weight of a pedelec at the time of sale. The weight of each additional accessory must be added to this weight.

**Permitted total weight**

*Source: EN 15194:2017:* weight of the fully assembled pedelec plus the rider and baggage, as specified by the manufacturer

**Young adult bicycle**

*Source: EN-ISO 4210-2:* bicycle designed for use on public roads by a young adult whose weight is less than 40 kg, with maximum saddle height of 635 mm or more and less than 750 mm. (see ISO 4210)

**Cargo bike**

*Source: DIN 79010:* bicycle mainly designed to carry goods.

**Wheel**

*Source: EN 15194:2017:* assembly or combination of hub, spokes or disc, and rim, but excluding tyre assembly

**Minimum insertion depth mark**

*Source: EN 15194:2017:* mark indicating the minimum insertion-depth of handlebar stem into fork steerer (fork stem) or seat post into frame

**Maximum continuous power**

*Source: ZEG:* the maximum continuous power is the maximum power for the electric motor output shaft during 30 minutes.

**Maximum saddle height**

*Source: EN 15194:2017:* vertical distance from the ground to the point where the top of the seat surface is intersected by the seat-post axis, measured with the saddle in a horizontal position and with the seat-post set to the minimum insertion-depth mark

**Maximum tyre pressure**

*Source: EN 15194:2017:* maximum tyre pressure recommended by the tyre or rim manufacturer for a safe and efficient performance. If the rim and tyre both indicate a maximum tyre pressure, the maximum inflation pressure is the lower of the two pressures indicated.

**Model year**

*Source: ZEG:* the model year refers to the first production year that the series-manufactured pedelec was manufactured in the version in question and is not always identical with the year of manufacture. The year of manufacture may be before the model year in some cases. If no technical modifications are introduced to the series, production may continue of pedelecs from a previous model year.

**Racing bicycle**

*Source: EN-ISO 4210-2:* bicycle intended for high-speed amateur use on public roads having a steering assembly with multiple grip positions allowing for an aerodynamic posture, a multi-speed transmission system, tyre width not greater

than 28 mm and a maximum mass of 12 kg for the fully assembled bicycle.

**Seat post**

*Source: EN 15194:2017:* component that clamps the saddle (with a bolt or assembly) and connects it with the frame

**Disc brake**

*Source: EN 15194:2017:* brake in which brake pads are used to grip the lateral faces of a thin disc attached to or incorporated in the wheel hub

**Quick-release device, quick release**

*Source: EN 15194:2017:* lever actuated mechanism that connects, retains or secures a wheel or any other component

**Type number**

*Source: ZEG:* all pedelec models have an eight-digit type number which is used to specify the design model year, the type of pedelec and the version.

**Off-road rough terrain**

*Source: EN 15194:2017:* coarse pebble tracks, forest trails, and other general off-road tracks where tree roots and rocks are likely to be encountered

**Consumables**

*Source: EN 82079-1:* any part or material that is necessary for continued use or maintenance of the product

**Maintenance**

*Source: DIN 31051:* maintenance is generally performed at regular intervals and often carried out by trained technical staff. This ensures a maximum service life and low wear and tear for the maintained items. Proper maintenance is often also a pre-requisite for providing a warranty.

## I. EC declaration of conformity

### Translation of the original EC Declaration of Conformity

The manufacturer:

HERCULES GMBH  
Longericher Straße 2  
50739 Köln, Germany

hereby declares that the electrically power assisted cycles of types:

20-Q-0037, 20-Q-0038, 20-Q-0039, 20-Q-0094, 20-Q-0094, 20-Q-0095, 20-Q-0095,  
20-Q-0096, 20-Q-0096, 20-Q-0100, 20-Q-0101, 20-Q-0102, 20-Q-0103, 20-Q-0104

*Year of manufacture 2019 and year of manufacture 2020*

comply with all applicable requirements of *Machinery Directive 2006/42/EC*.  
Furthermore, the electrically power assisted cycles comply with all applicable basic  
requirements of *Electromagnetic Compatibility Directive 2014/30/EU*.

The following standards were applied: *ISO/DIS 20607:2018* Safety of machinery –  
Instruction handbook –General drafting principle; *EN 15194:2018* Cycles –  
Electrically power assisted cycles – EPAC bicycles and *EN 11243:2016* Cycles –  
*Luggage carriers for bicycles – Requirements and test methods*.

Ms. Janine Otto (Technical Editor), c/o HERCULES GMBH, Longericher Straße 2,  
50739 Köln, Germany, is authorised to compile the technical documentation.



Cologne, 08/05/2019

.....  
Place, date and signature

Georg Honkomp  
-Managing Director-