
**IMPORTANT
READ CAREFULLY BEFORE USE
KEEP SAFE TO CONSULT AT A LATER DATE**



**TRANSLATION OF THE ORIGINAL
OPERATING INSTRUCTIONS**

EN

ELECTRIC BICYCLES

2° E Pro Street, 2° E Pro Street S, 2° E Pro 5, 2° E Pro Cross

KC156-VAKxxx, KC174-VBKxxx, KC157-VAFxxx, KC158-VAKDxx

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Data sheet

Surname, first name of the purchaser:

Date of purchase:

Model:

Frame number:

Type number:

Unladen weight (kg):

Tyre size:

Recommended tyre pressure (bar)*: front: rear:

Wheel circumference (mm):

Company stamp and signature:

*After a tyre change, refer to the tyre markings for the permitted tyre pressures and make sure that they are observed. The recommended tyre pressure must not be exceeded.

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1

About these instructions

Read these operating instructions before commissioning the bicycle to ensure you use all the functions correctly and safely. The operating instructions are not a substitute for personal instruction by the supplying specialist dealer. The operating instructions are a component part of the bicycle. Therefore, if it is re-sold at a later time, they must be handed over to the subsequent owner.

These operating instructions are mainly intended for the rider and operator of the bicycle, who tend to be non-professionals.



Text passages which are expressly intended for specialist staff (e.g. bicycle mechanics) are clearly marked with a tool symbol.

Staff at all specialist dealers have specialist training and qualifications, and are therefore capable of identifying risks and preventing hazards which may arise during maintenance, servicing and repairs on the bicycle. Information for specialist staff does not require non-professionals to take any action.

1.1

Manufacturer

The manufacturer of the bicycle is:

KETTLER Alu-Rad GmbH
Longericher Straße 2
50739 Köln, Germany

Tel.: +49 6805 6008-0
Fax: +49 6805 6008-3098
E-mail: info@kettler-alu-rad.de
Internet: www.kettler-alu-rad.de

1.2 **Laws, standards and directives**

These operating instructions comply with the essential requirements from:

- Machinery Directive 2006/42/EC
- Electromagnetic Compatibility Directive 2014/30/EU
- EN ISO 12100:2010 Safety of machinery – General principles of design – Risk assessment and reduction,
- EN 15194:2015, Cycles – Electrically power assisted cycles – EPAC bicycles,
- EN ISO 4210, Cycles – Safety requirements for bicycles,
- EN 11243:2016, Cycles – Luggage carriers for bicycles – Requirements and test methods
- EN 82079-1:2012, Preparation of instructions for use – Structuring, content and presentation – Part 1: General principles and detailed requirements and
- EN ISO 17100:2016-05, Translation Services – Requirements for translation service.

1.3 **Other valid documents**

These operating instructions are only complete in conjunction with the other valid documents.

The following document applies for this product:

- Charger operating instructions.

No other information is also applicable.

The constantly updated lists of approved accessories and parts are available to specialist dealers.

1.4 Subject to change

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

You will find any modifications to these operating instructions at:

www.kettler-alu-rad.de/de/de/index/service/anleitung

1.5 Language

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

1.6

For your safety

The safety concept of the bicycle comprises four elements:

- rider and/or operator instruction, and bicycle maintenance and repair by the specialist dealer,
- the section on general safety
- the warnings in these instructions and
- the safety marking on the nameplates.

1.6.1

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 in the data sheet. If you are unable to contact your specialist dealer, you will find other specialist dealers online at www.kettler-alu-rad.de.



The specialist dealer authorised to perform repairs and maintenance work receives regular training.

The rider or the operator of the bicycle will be instructed in person on the bicycle functions when the supplying specialist dealer hands over the bicycle, if not before. This instruction particularly covers the bicycle's electrical functions and correct use of the charger.

Each rider to whom this bicycle is provided must receive instruction on the bicycle's functions. The operating instructions must be submitted to each rider in printed form and must be acknowledged and adhered to.

1.6.2 Basic safety instructions

These operating instructions have a chapter with general safety instructions [▷ *Chapter 2, page 18*]. You can distinguish this chapter as it has a grey background.

1.6.3 Warnings

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





SIGNAL WORD	Type and source of the danger
	Description of the danger and the consequences. ► Measures
	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.

Table 1: Meanings of the signal words

1.6.4

Safety markings

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



General warning



Adhere to the instructions for use

Table 2:

Meaning of safety markings

1.7

For your information

1.7.1

Instructions for actions

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

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

1.7.2

Information on the nameplate

Alongside the warnings, the nameplates of the products also contain other important information on the bicycle:






 1	Suitable for tarmacked and paved roads – no off-road riding or jumps.
 2	Suitable for tarmacked roads, cycle paths and firm gravel paths and roads, longer sections with moderate slopes and jumps up to 15 cm.
 3	Suitable for tarmacked roads, cycle paths and easy to demanding off-road riding, sections with moderate slopes and jumps up to 61 cm.
 4	Suitable for tarmacked roads, cycle paths and easy to demanding off-road riding, limited downhill use up to 25 km and jumps up to 122 cm.
 5	Suitable for tarmacked roads, cycle paths and easy to extremely difficult off-road riding, unlimited downhill use and any jumps.

Table 3:

Relevance of area of use



City and trekking bicycle



Child's bicycle / bicycle for young adults



Mountain bike



Racing bicycle



Cargo bike



Folding bicycle

Table 4:

Relevance of bicycle type

About these instructions



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 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 5:

Relevance of safety instructions

1.7.3

Language conventions

The bicycle described in these operating instructions may be equipped with alternative components. The equipment of the bicycle is defined by the 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
Operating instructions	Original operating instructions or translation of the original operating instructions
Bicycle	Electric motor driven cycle
Motor	Drive motor

The following conventions are used in these operating instructions:

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

1.8

Nameplate

The nameplate is situated on the *frame*. The nameplate features the following information:

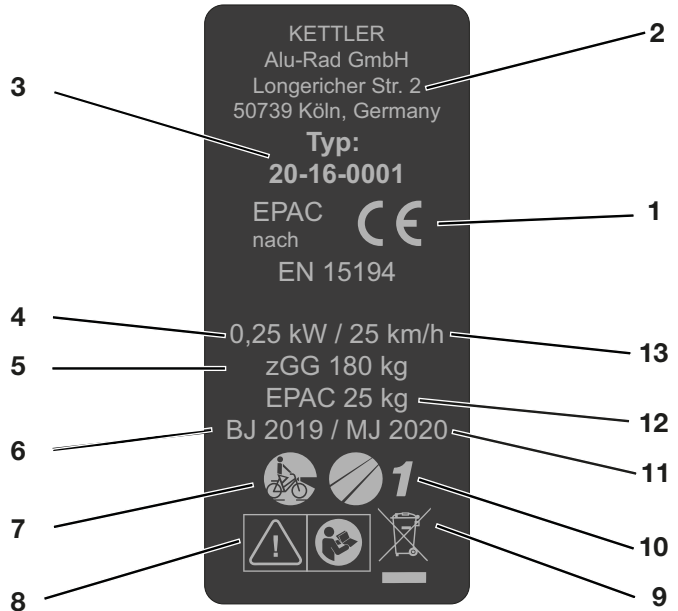


Figure 1:

Nameplate, example

- 1 CE marking
- 2 Manufacturer
- 3 Type number
- 4 Nominal continuous power
- 5 Permitted total weight
- 6 Year of manufacture
- 7 *Bicycle type*
- 8 *Safety instructions*
- 9 *Disposal instruction*
- 10 *Area of use*
- 11 Model year
- 12 Weight of the ready-to-ride bicycle
- 13 Shut-off speed

1.9 Identifying

1.9.1 Operating instructions

The identification number of these operating instructions is made up of the document number, the version number and the release date. It can be found on the cover page and in the footer.

Identification number	87700134_1.0_19.08.2019
------------------------------	-------------------------

Table 6:

Identification number of the operating instructions

1.9.2 Bicycle

These KETTLER operating instructions refer to the *model year* 2019. The production period is from August 2018 to July 2019. They are issued in August 2018.

The operating instructions are a component part of the following bicycles:

Type number	Model	Bicycle type
KC156-VAKxxx	2° E Pro Street	City and trekking bicycle
KC174-VBKxxx	2° E Pro Street S	City and trekking bicycle
KC157-VAFxxx	2° E Pro 5	City and trekking bicycle
KC158-VAKDxx	2° E Pro Cross	City and trekking bicycle

2 Safety

2.1 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 14 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.

2.2 Hazards for vulnerable groups

The battery and charger must be kept out of the reach of children.

If the bicycle is used by minors, 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 bicycle is being used as per these operating instructions. Legal guardians hold sole responsibility for determining whether minors are capable of using the bicycle.

2.3 Personal protective equipment

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

2.4

Proper use

The bicycle is designed to support a maximum speed of 25 km/h. The bicycle may only be used in a perfect, fully functional condition.

National requirements may apply to the bicycle which differ from the standard equipment. For riding on public roads, some special regulations apply in relation to the *riding 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 must be met. Approved accessories can be installed by specialist staff.

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

2.4.1



City and trekking bicycle

City and trekking bicycles are designed for daily, comfortable use. They are suitable for riding on public roads.

Area of use:



1

Suitable for tarmacked and paved roads.



2

Suitable for tarmacked roads, cycle paths and firm gravel paths and roads, and longer sections with moderate slopes and jumps up to 15 cm.

2.5

Improper use

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

- when the electrical drive has been manipulated
- when the permitted gross load weight is exceeded
- riding with a damaged or incomplete bicycle
- riding over steps
- riding through deep water
- lending the bicycle to untrained riders
- carrying other people
- riding with excessive or unsecured 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.

2.5.1



City and trekking bicycle

City and trekking bicycles are not sports bicycles. If used for sports, the rider can expect reduced riding stability and diminished comfort.

Non-permitted areas of use:



1

Never drive off-road or perform jumps.



2

Never drive off-road or perform jumps over 15 cm.

2.6

Duty to take care

The safety of the bicycle can only be assured if all the necessary measures are taken.

2.6.1

Rider

The rider:

- receives instruction before the first ride. They can clarify any questions relating to the operating instructions with the operator or specialist dealer.
- wears personal protective equipment.
- assumes all the obligations of the operator in case the bicycle changes hands.

2.6.2

Operator

The operator has the duty of care and responsibility for scheduling these measures and checking that they are implemented.

The operator:

- makes these operating instructions available to the rider for the duration of use of the bicycle. If necessary, they translate the operating instructions into a language which the rider understands.
- familiarises the rider with the functions of the bicycle before the first ride. Only riders who have received instruction may be allowed to ride.
- instructs the rider on proper use and the wearing of personal protective equipment.
- only employs specialist staff for maintenance and repair of the bicycle
- ensures that there is no unauthorised access, such as preventing replacement of gear sprockets with parts which are not original parts.

The printed EC Declaration of Conformity in the appendix is valid providing that the bicycle remains unchanged from its original condition. As soon as the operator makes any relevant modifications or additions, they legally become the manufacturer. He must independently guarantee compliance with the EC directives again in order to:

- circulate the bicycle again,
- attach the CE marking again and
- avoid compromising occupational safety.



3 Description

3.1 Overview



Figure 2: Bicycle viewed from the right, 2° E Pro 5 used as example

- 1 *Front wheel*
- 2 *Fork*
- 3 *Front mudguard*
- 4 *Handlebars*
- 5 *Headlight*
- 6 *Stem*
- 7 *Frame*
- 8 *Seat post*
- 9 *Saddle*
- 10 *Rear mudguard*
- 11 *Rear light and reflector*
- 12 *Rear wheel*
- 13 *Chain*
- 14 *Rechargeable battery, frame number and nameplate*

3.2

Handlebars

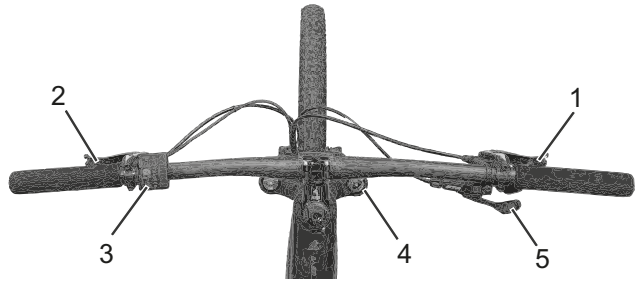


Figure 3:

Detailed view of bicycle from rider position, example

- 1 Rear brake lever
- 2 Front brake lever
- 3 Control panel
- 4 Fork lock on suspension fork head
- 5 *Shifter*

3.3 Wheel and fork

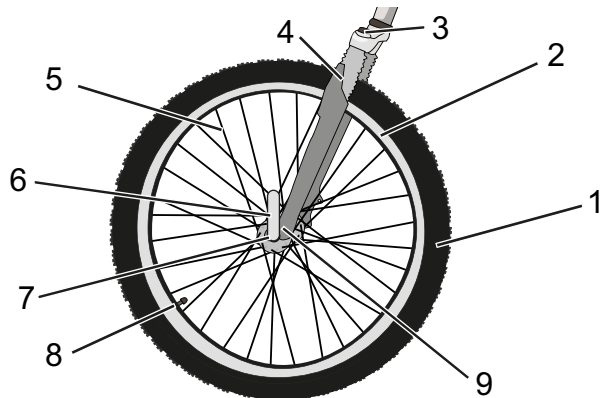


Figure 4: Components of the wheel – example showing front wheel

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

3.3.1 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 bicycle either has a classical *Dunlop valve*, a *Presta valve* or a *Schrader valve*.

Dunlop valve



The rider can easily exchange the valve and quickly release the air. The air pressure cannot be measured with this valve.

Presta valve



The Presta valve requires a smaller hole in the rim, which is why it is especially suitable for the narrow rims of racing bicycles. The air pressure can be measured with this valve.

Schrader valve



The rider can fill the Schrader valve very easily at a petrol station. The air pressure can be measured with this valve.

3.3.2

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 5: Bicycle 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.

3.3.3 Suspension fork structure

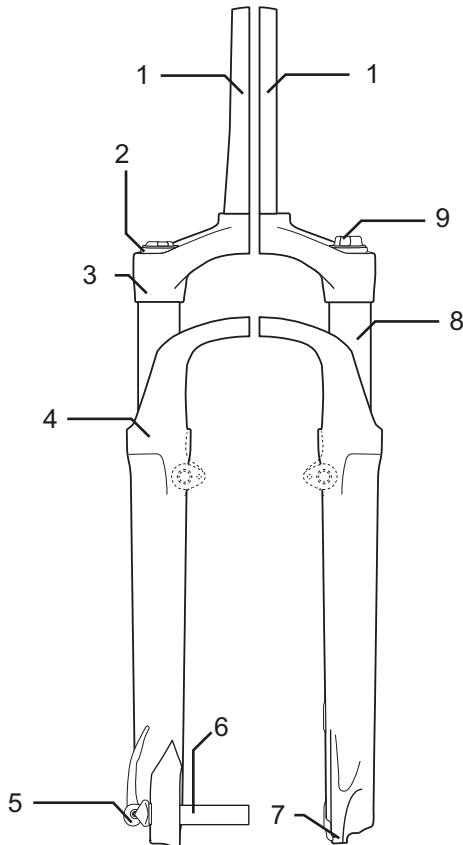


Figure 6: Example showing Suntour fork: The stem and handlebars are fastened to the fork steerer (1). The wheel is fastened to the quick release axle (6). Other elements: The compression setting (2), crown (3), Q-Loc (5), dust seal (6), fork end for quick release (7), stanchion (8) and spring (9)

3.3.3.1

Air suspension fork structure

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

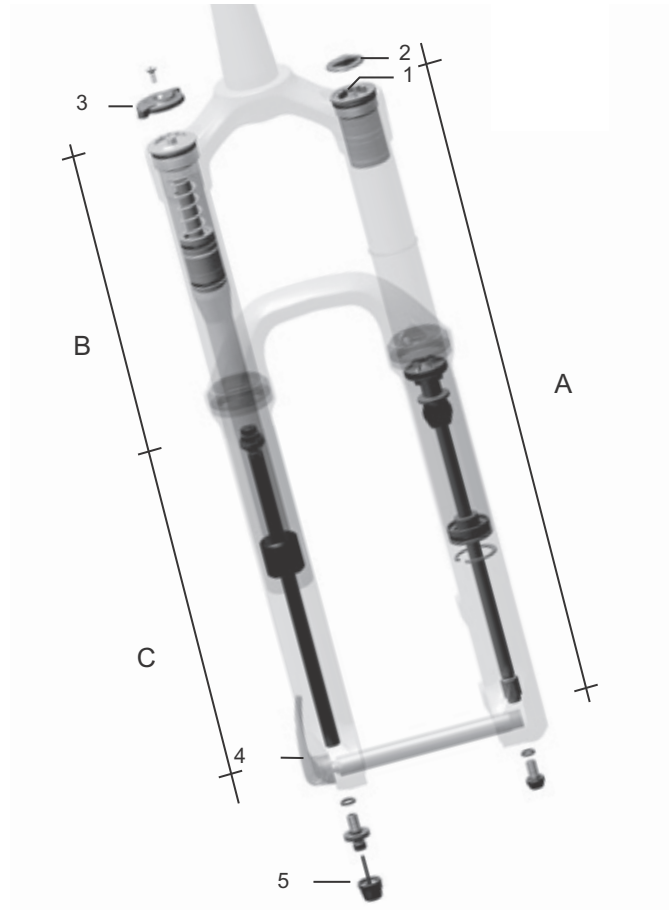


Figure 7:

Air suspension fork structure, Suntour

Diagram with the operating elements: 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)

3.4

Brake system

The bicycle's brake system comprises a hydraulic rim brake on both the front and rear wheel.

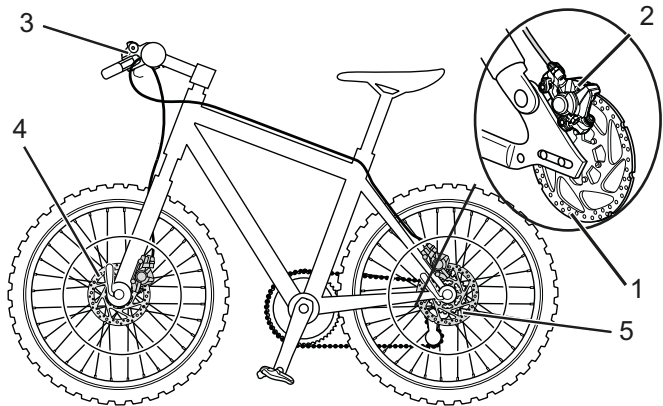


Figure 8:

Bicycle brake system with a disc brake, example

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

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

The brake lever is pushed 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 pushed, the brake linings are pressed against the brake disc and the wheel movement is decelerated until it comes to a stop.

3.5

Electric drive system

The bicycle is driven by muscle power via 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.

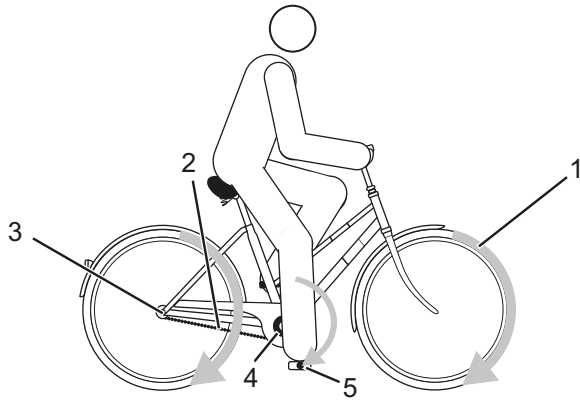


Figure 9:

Diagram of mechanical drive system

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

The bicycle also has an integrated, electric drive system.

The electric drive system is made up of 5 components:

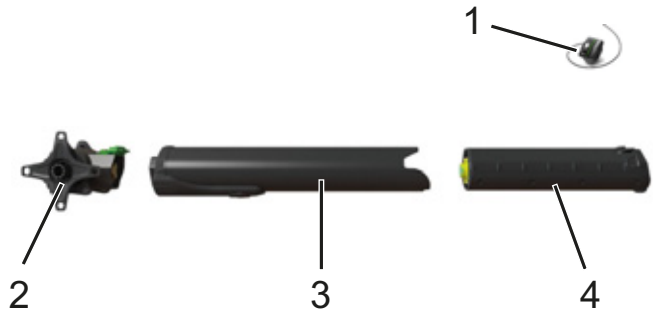


Figure 10:

Diagram of electric drive system

- 1 Control panel
- 2 Bottom-bracket gears
- 3 *Drive unit*
- 4 *Rechargeable battery*
- 5 A charger which is designed for the battery.

3.5.1

Drive unit

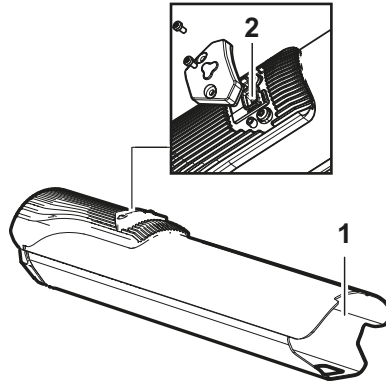


Figure 11:

Drive unit

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 system performance is determined using the pedal assistance settings on the control panel.

The bicycle does not have a separate emergency stop or emergency shut-off button. 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.

When you step on the pedals again and the speed drops below 25 km/h, the system starts again

A push assist system can be activated. The speed depends on the selected gear. The rider brakes the bicycle by holding the bicycle while pushing.

3.5.2

Rechargeable battery

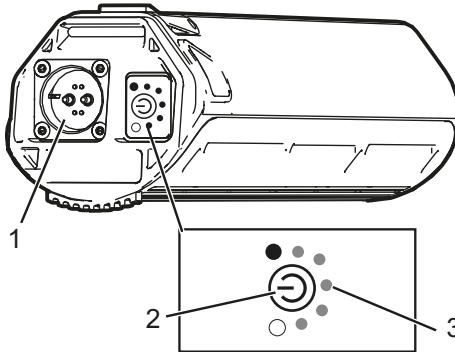


Figure 12:

Rechargeable battery, view of charging port side

- 1 Charging port
- 2 On-Off button
- 3 Battery level indicator (battery)

The lithium ion battery has an internal electronic protection circuit. This is matched to the charger and bicycle motor. 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. If the bicycle has not been moved for 10 hours and no button has been pressed on the control panel or the charge level of the battery falls below 30%, the bicycle has not been moved for 3 hours and no button has been pressed on the control panel, the electric drive system and the battery automatically switch off to save energy.

The battery's service life can be extended if it is well maintained and, above all, stored at the correct temperatures. The 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

When the battery is switched on, the battery level indicator shows the start animation. The LEDs then briefly indicate the charge level of the battery.

If the battery is switched on, the charge level can be queried by briefly pressing the On-Off button.

The five green LEDs on the battery level indicator show the battery level when the battery is switched on. Each LED represents 20% of the charge level.

When the battery is discharged, the last LED lights up intermittently. The charge level of the battery is also shown on the display.

3.5.3

Control panel

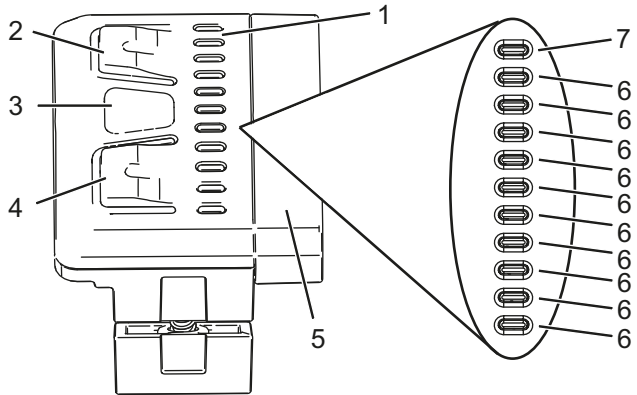


Figure 13:

Overview of the structure and operating elements

Designation	
1	Display bar
2	Top button
3	Middle button
4	Bottom button
5	Extension cable
6	Battery level indicator or pedal assistance
7	Status screen

Table 8:

Operating elements overview

The control panel controls the drive system via three buttons and displays either the charge level of the battery or the pedal assistance selected.

The bicycle's battery supplies the control panel with energy when a sufficiently charged battery is inserted into the bicycle, and the drive system is switched on.

Operating temperature	-20 ... +60 °C
Storage temperature	-20 ... +60 °C
Protection rating (with USB cover closed)	IP54
Weight about	0.075 kg

Table 9:

Display technical data**3.5.3.1****Display bar**

The control panel display bar consists of 11 LEDs. The uppermost LED serves as a status display to provide information on the status of your e-bike. The remaining 10 LEDs serve as an indicator for the battery level and pedal assistance.

Status screen

The status screen indicates a status change or an existing fault. The status indicator does not light up if no fault is detected.

The different colours of the status screen have the following meaning:

Colour	Meaning
Green	The status screen briefly flashes green after the drive pack has been successfully installed in the bicycle. This gives you a visual signal that the system can now be switched on.
Yellow	The status screen briefly turns yellow when a "soft fault" is detected. This means that there is a temporary or non-critical disturbance, which in most cases leads to a loss of performance. In the event of a "soft fault", you can still ride your bicycle. However, this is not recommended.
Red	The status screen briefly turns red when a "hard fault" is detected. In the event of a "hard fault", the bicycle cannot be operated and must be serviced.

Table 10:

Meaning of status screen colours

3.5.3.2**Level of assistance**

You can adjust the desired level of assistance using the control panel. The pedal assistance can be changed at any time.

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

The following levels of assistance are possible:

Level of assistance	Use
NONE	Motor assistance is deactivated. The bicycle can be used as a normal bicycle.
BREEZE	Low but effective support for maximum range.
RIVER	Reliable assistance for most usage situations.
ROCKET	Maximum assistance for very demanding excursions.

Table 11:

Overview of levels of assistance

Level of assistance	Colour	Max. assistance factor	Max. output
NONE	WHITE	0%	0 W
BREEZE	GREEN	75%	125 W
RIVER	BLUE	150%	250 W
ROCKET	PINK	240%	400 W

Remaining range

Precise information about the range of your system is not possible before or during an excursion. Several factors can influence the range of the bicycle, such as level of assistance, speed, gear switching habits, tyre type and pressure, route and weather conditions, weight of rider and bicycle or the condition or age of the battery.

3.6

Charger

The lithium ion battery has an internal electronic protection circuit. It is matched to the charger. The bicycle may therefore only be charged using the charger provided.

Nominal input voltage	100 ... 240 V AC
Frequency	50 ... 60 Hz
Output voltage	42 V DC
Charging current	2 A
Operating temperature	-20 ... +60 °C
Storage temperature	-20 ... +60 °C
Protection class	IP 54
Weight about	0.6 kg

Table 12:

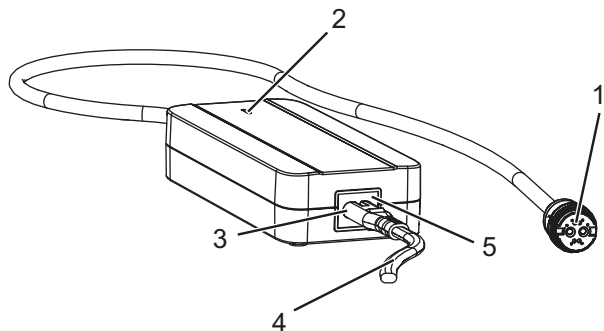
Charger technical data

Figure 14:

Charger detail

- 1 Mains plug
- 2 LED display charger
- 3 Mains plug
- 4 Connecting cable
- 5 Power jack

4 Technical data

Bicycle

Transportation temperature	-20 ... +60 °C
Operating temperature	-20 ... +60 °C
Storage temperature	-20 ... +60 °C
Discharging temperature	-20 ... +60 °C
Charging temperature	0 ... +45 °C
Power output/system	250 W (0.25 kW)
Shut-off speed	25 km/h
Weight of ready-to-ride bicycle	See nameplate

Table 13: Bicycle technical data

Drive unit

Continuous power rating	250 W
Max. output	400 W
Torque on chain, max.	60 Nm
Nominal voltage	36 V
Operating temperature	-20 ... +60 °C
Storage temperature	-20 ... +60 °C
Protection class	IP 54
Weight about	2 kg

Table 14: Drive unit technical data

Rechargeable battery

Type	Lithium ion battery
Nominal voltage	36 V
Nominal capacity	7 Ah
Power	252 Wh
Operating temperature	-20 ... +60 °C
Storage temperature	-20 ... +60 °C
Discharging temperature	-20 ... +60 °C
Charging temperature	0 ... +45 °C
Protection class	IP 54
Weight about	1.4 kg

Table 15:

Rechargeable battery technical data

Control panel

Operating temperature	-20 ... +60 °C
Storage temperature	-20 ... +60 °C
Protection rating (with USB cover closed)	IP54
Weight about	0.075 kg

Table 16:

Display technical data

Bottom-bracket gears

Assistance torque, max.	60 Nm
Q factor, min.	135 (without crank arm)
Operating temperature	-20 ... +60 °C
Storage temperature	-20 ... +60 °C
Protection class	IP 54
Chainline	49, 52 mm
Weight about	1.3 kg

Table 17:

Bottom-bracket gears technical data

Charger

Nominal input voltage	100 ... 240 V AC
Frequency	50 ... 60 Hz
Output voltage	42 V DC
Charging current	2 A
Operating temperature	-20 ... +60 °C
Storage temperature	-20 ... +60 °C
Protection class	IP 54
Weight about	0.6 kg

Table 18:

Charger technical data

Emissions

A-weighted emission sound pressure level < 70 dB(A)

Total vibration level for the hands and arms < 2.5 m/s²

Highest effective value of weighted acceleration for the entire body < 0.5 m/s²

Table 19:

Emissions from the bicycle*

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

Tightening torque

Axle nut tightening torque 35 Nm - 40 Nm

Handlebars clamping screw maximum tightening torque* 5 Nm - 7 Nm

Table 20:

Tightening torque values*

***if there is no other data on the component**

5 Transportation, storage and assembly

5.1 Transporting



Crash caused by unintentional activation

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

- ▶ Remove the battery before the bicycle 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 push the brake lever when the wheel has been dismantled.
- ▶ Always use the transport securing system when transporting dismantled wheels.

NOTICE

If the bicycle is lying flat, oil and grease may leak from the bicycle.

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

- ▶ Only transport the bicycle in an upright position.
-

NOTICE

Bicycle rack systems which secure the bicycle standing on its head by the *handlebars* or *frame*, generate inadmissible forces on the components during transportation. This can cause the supporting parts to break.

- ▶ Never use bicycle rack systems which secure the bicycle standing on its head by the *handlebars* or *frame*.
- ▶ Take into account the ready-to-use bicycle's weight when transporting it.
- ▶ Remove the *display* and the batteries before transporting the bicycle.
- ▶ Protect the electrical components and connections on the bicycle from the elements with suitable protective covers.
- ▶ Remove accessories, for example drinking bottles, before transportation of the bicycle.
- ▶ When transporting by car, you must use a suitable bicycle rack system.



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

- ▶ Transport the bicycle in a dry, clean place where it is protected from direct sunlight.



When shipping the bicycle, we recommend that you have the bicycle partially dismantled in the proper manner and packaged by the specialist dealer.

5.1.1

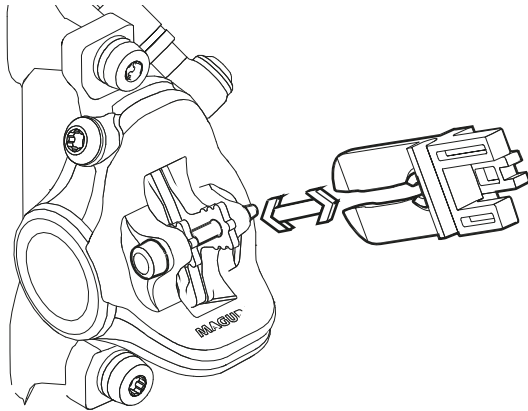
Transporting the battery

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. The parcel service must be made aware of the presence of hazardous goods in the packaging.

5.1.2

Using the transport securing system

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



- ▶ Fastening the transport securing device.

Transportation temperature	-20 ... +60 °C
----------------------------	----------------

Table 21:

Bicycle transport temperature

5.2

Storing



Risk of fire and explosion due to high temperatures

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

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



If the bicycle is lying flat, oil and grease may leak from the bicycle.

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

- ▶ Only store the bicycle in an upright position.



The battery discharges when not in use. Storing a discharged battery for longer periods can cause serious damage to your battery or significantly reduce its capacity.

- ▶ If the bicycle 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 bicycle with a hydraulic seat post upside down on the floor; otherwise you, will damage the seat post lever.
- ▶ Store the bicycle, battery and charger in a dry, clean location.

Storage temperature -20 ... +60 °C

Table 22:

Bicycle storage temperature

5.2.1

Break in operation

NOTICE

The battery discharges when not in use. Storing a discharged battery for longer periods can cause serious damage to your battery or significantly reduce its capacity.

NOTICE

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

- ▶ Never connect the battery to the charger permanently.
-

If the bicycle is to be removed from service for longer than four weeks, e.g. in winter, a break in operation has to be prepared. It is recommended to store the battery and the drive unit.

5.2.1.1

Preparing a break in operation

- ✓ Remove the battery and drive unit from the bicycle.
- ✓ Charge the battery to 60% (three LEDs of the battery level indicator light up).
- ✓ The bicycle has 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 an inspection and basic cleaning and apply preservative agent.

5.2.1.2

Taking out of operation

- ▶ Check the battery after 6 months. With a battery level of 20% or less, charge the battery to 60% again.

1 month	-20 to +60 °C
3 months	-20 to +45 °C
1 year	-20 to +25 °C

Table 23: Storage time with 60% charge

5.3

Assembly



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 bicycle in a clean and dry environment.
- ✓ The working environment temperature should be between 15 °C and 25 °C.

Working environment temperature	15 °C - 25 °C
--	---------------

Table 24:

Working environment temperature

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

5.3.1

Required tools

The following tools are required to assemble the bicycle:

- 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.

5.3.2

Unpacking



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.

5.3.3

Scope of delivery

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

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

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

The battery is supplied separately from the pedelec.

5.3.4

Commissioning**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 and these operating instructions clearly to prevent mix-ups – with the bicycle *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 bicycle requires special tools and specialist knowledge.

Experience has shown that a bicycle which has not yet been sold, is spontaneously handed to consumers as soon as it appears ready to ride.

- ▶ For this reason, every vehicle must be prepared, so that it is fully ready for use immediately after being assembled.
- ▶ Staff should work through the initial commissioning check list to prepare the vehicle, so that it is ready to ride.

Initial commissioning check list

- | | |
|--------------------------|---|
| <input type="checkbox"/> | Check battery. |
| <input type="checkbox"/> | The battery is partially charged when delivered. Fully charge the battery to ensure full power. |
| <input type="checkbox"/> | Mount the wheels, quick release and pedals. |
| <input type="checkbox"/> | Re-adjust the quick release clamping force if necessary. |
| <input type="checkbox"/> | Thoroughly degrease the brake discs in disc brakes or the brake sides and linings in rim brakes with brake cleaner or spirit. |
| <input type="checkbox"/> | Place handlebars, stem and saddle in the functional position and check they are firmly in place. |
| <input type="checkbox"/> | Check all the components to make sure that they are firmly in place. Check all the settings and the tightening torque on the axle nuts. |
| <input type="checkbox"/> | Check the entire cable harness to make sure that it is routed properly: <ul style="list-style-type: none">• You must prevent the cable harness from coming into contact with moving parts.• The cable routes must be smooth and free from sharp edges.• Moving parts must not apply any pressure or tension to the cable harness. |
| <input type="checkbox"/> | Check the drive system, the light equipment and the brakes to make sure that they are fully functional and effective. |
| <input type="checkbox"/> | Adjust the headlight. |
| <input type="checkbox"/> | Set the drive system has to the national language and the appropriate system of measurement. |
| <input type="checkbox"/> | Check the software version of the drive system and update it as necessary. |
| <input type="checkbox"/> | Take a test drive to check the brake system, gear shift and the electric drive system. |

5.3.4.1

**Checking the battery****Risk of fire and explosion due to faulty battery**

The safety electronics may fail if the batteries are 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 battery level indicator light up, the battery may be damaged.
 - ⇒ The battery can be charged if at least one, but not all, of the LEDs on the battery level indicator is lit up. Fully charge the battery before initial commissioning in order to ensure that the full capacity of the battery is available.
- ▶ After initial commissioning and before every further use, the battery is switched on using the On-Off button.

5.3.5

Installing the wheel in the Suntour fork *Alternative*

5.3.5.1

Installing the wheel with screw-on axle (15 mm) *Alternative*

- ▶ Insert the axle completely on the drive side.

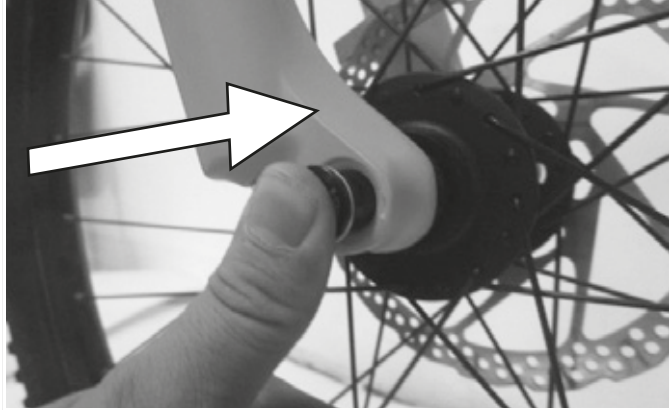


Figure 15:

Fully inserting the axle

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

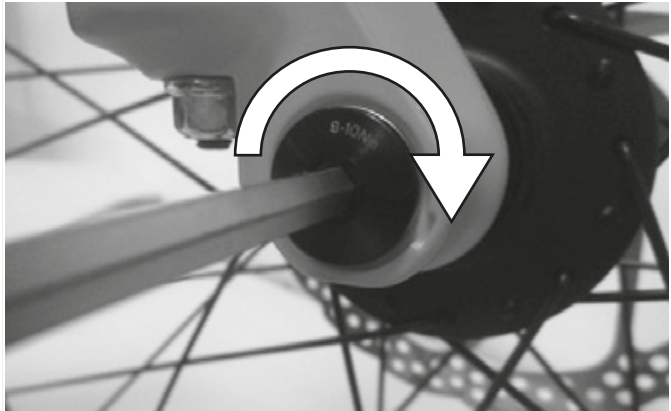


Figure 16:

Tightening the axle

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



Figure 17:

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.

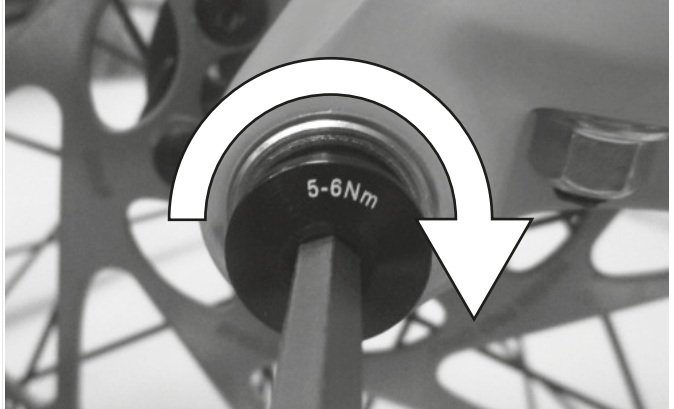


Figure 18:

Tightening the securing screw

5.3.5.2

**Installing the wheel with screw-on axle (20 mm)
Alternative**

- ▶ Insert the axle completely on the drive side.

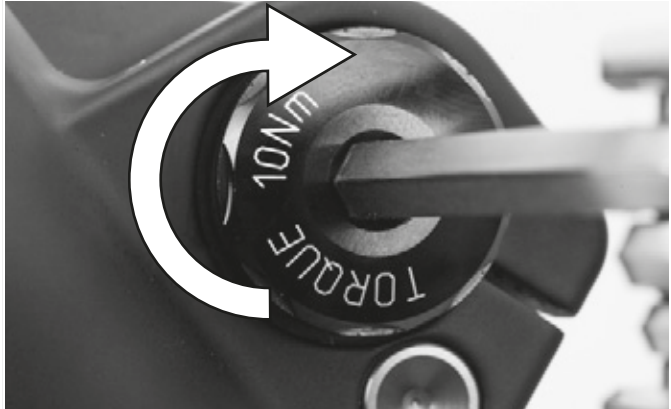


Figure 19:

Tightening the inserted axle

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



Figure 20:

Tightening the axle

5.3.5.3

Installing the wheel with a quick release axle
Alternative



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.

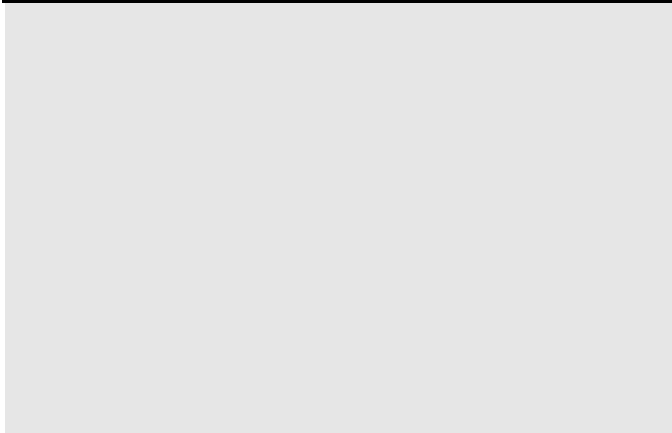
- ▶ The quick release axle and the brake disc must be opposite one another.



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.

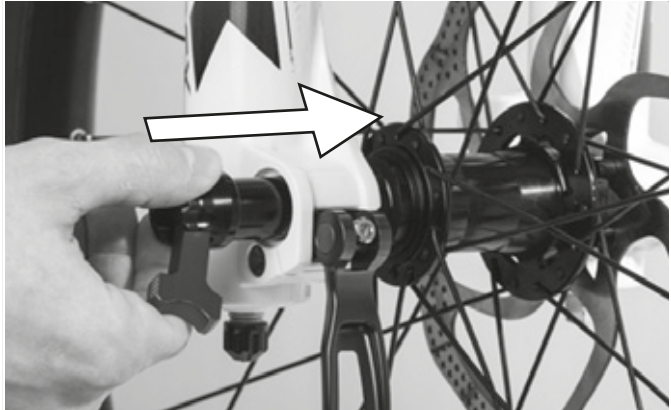


Figure 21: Pushing the axle into the hub

- ▶ Tighten the axle with the red handle.

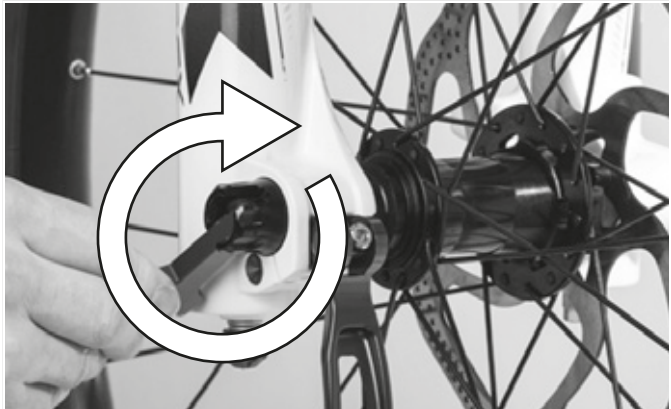


Figure 22: Tightening the axle

► Push the quick release lever into the axle.

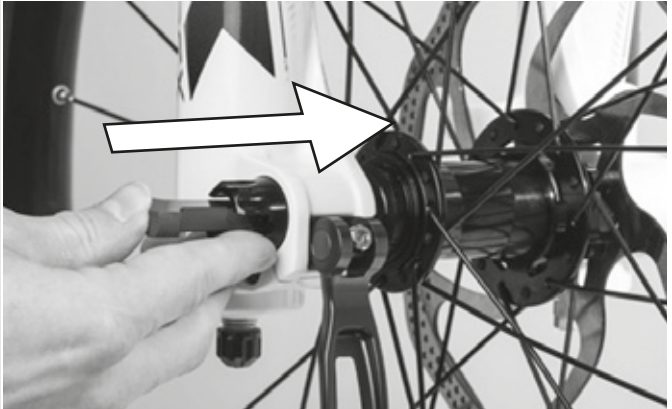


Figure 23:

Pushing the quick release lever into the axle

► Reverse the quick release lever.

↪ The lever is secured.



Figure 24:

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 25:

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.

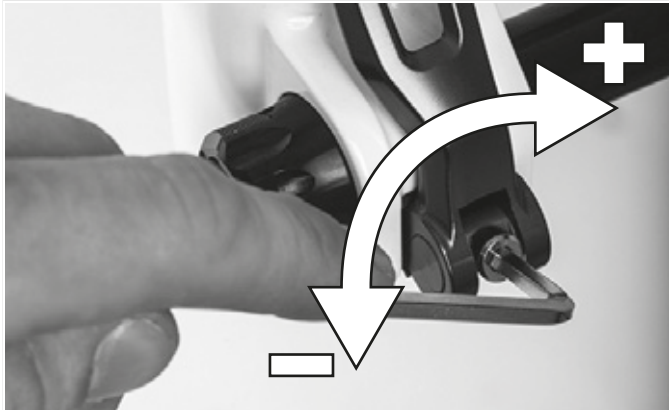


Figure 26:

Adjusting the quick release clamping force

5.3.6

Installing the wheel with a quick release*Alternative***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 installing, ensure that the quick release flange is extended. Open the lever completely.

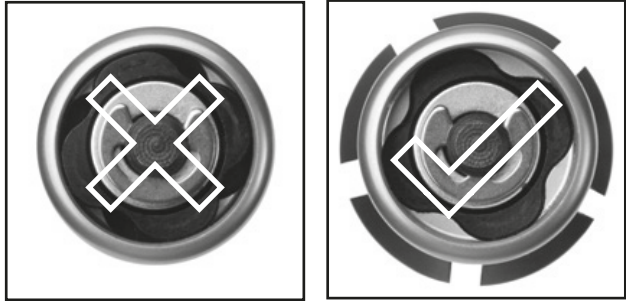


Figure 27:

Closed and opened flange

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

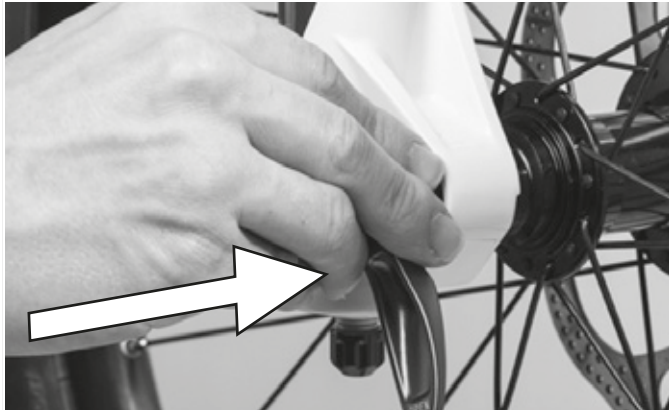


Figure 28:

Pushing the quick release in

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

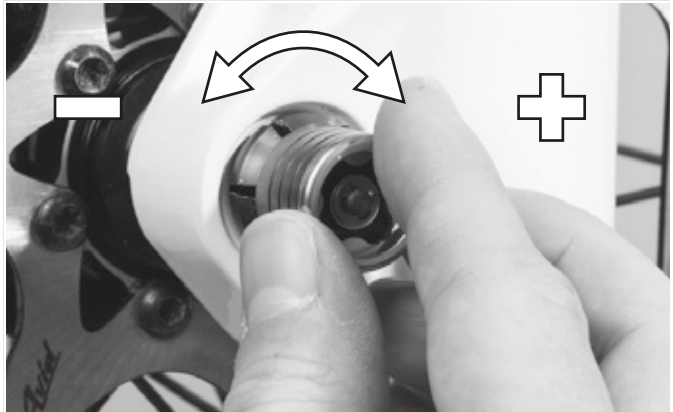


Figure 29:

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 30:

Closing the quick release

5.3.6.1

Checking the stem and handlebars

Checking connections

- ▶ Stand in front of the bicycle to check whether the handlebars, stem and fork shaft 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 bicycle 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.

5.3.7

Selling the bicycle

- ▶ Fill out the data sheet on the first page of the operating instructions.
- ▶ Adjust the bicycle to the rider.
- ▶ Set the *stand* and the *shifter*, and show the purchaser the settings.
- ▶ Instruct the operator or rider how to use all the functions of the bicycle.

6 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 bicycle 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.

6.1 Adjusting the saddle

6.1.1 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 bicycle to your needs for the first time.

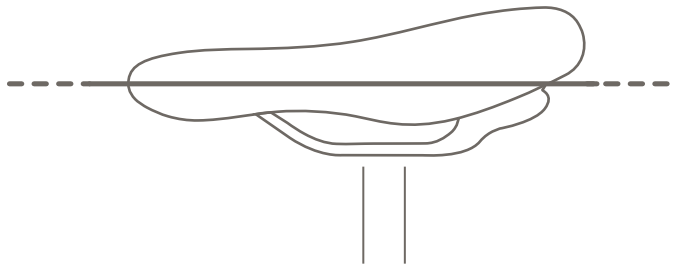


Figure 31: Horizontal saddle tilt

6.1.2

Determining the seat height

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

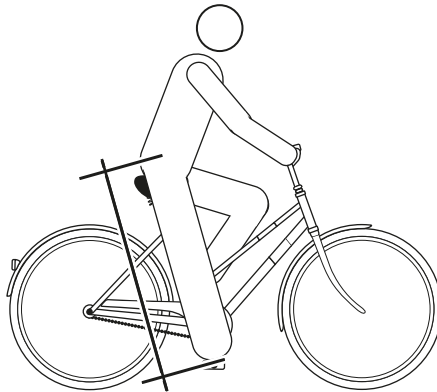


Figure 32:

Optimal saddle height

6.1.3

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.

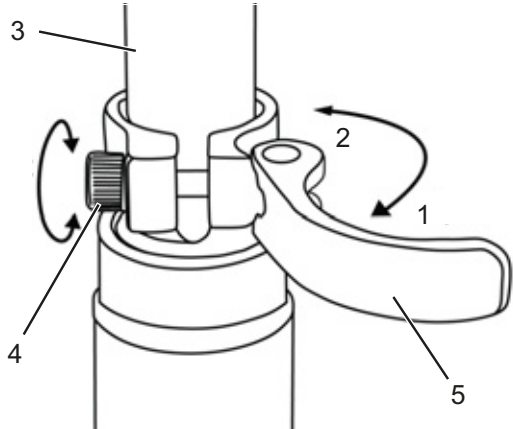


Figure 33:

Seat post quick release (3) 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* with 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.
-

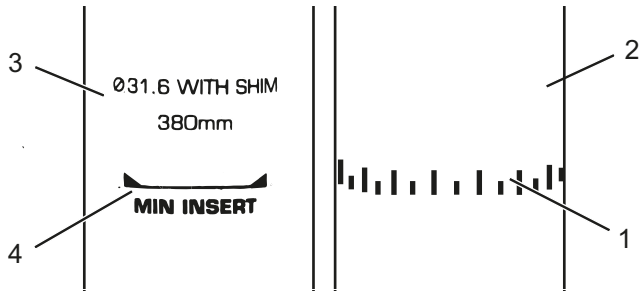


Figure 34:

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*.

6.1.4

Setting the height-adjustable seat post

- ▶ 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.

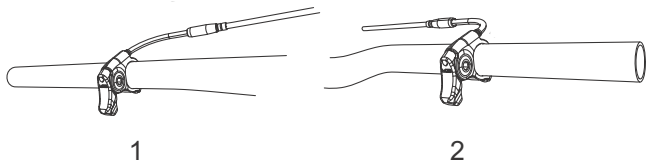


Figure 35:

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

6.1.4.1 Lowering the saddle

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

6.1.4.2 Raising the saddle

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

6.1.5 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 bicycle near to a wall, so that you can lean on the wall to support yourself or ask another person to hold the bicycle for you.
- ▶ Climb onto the bicycle.
- ▶ 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).

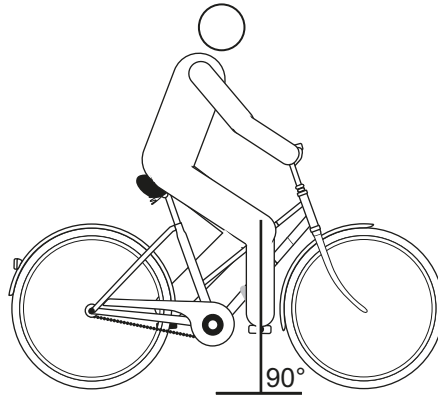


Figure 36: Knee cap perpendicular line

6.2

Adjusting the handlebars



- ✓ The handlebar settings 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.

Maximum tightening torque for the clamping screws of the handlebars*

5 Nm - 7 Nm

*if there is no other data on the component

Table 25: Handlebars clamping screw maximum tightening torque

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.
-

6.2.1

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.

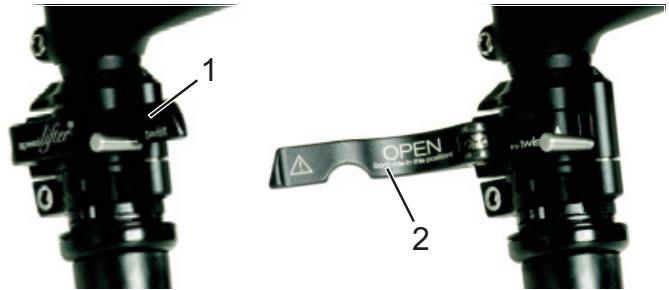


Figure 37:

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

6.2.2

Turning the handlebars to the side *Alternative*



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.

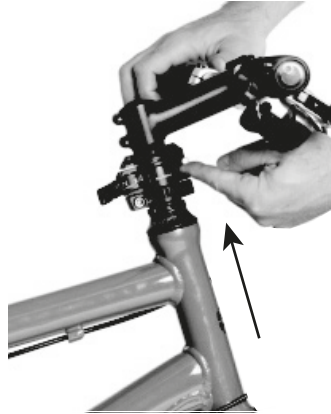


Figure 38: Pulling locking lever upwards – by.schulz speedlifter used as an example

6.2.2.1 Checking the clamping force of the 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.

6.2.2.2 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 Adjusting the brake lever

6.3.1 Adjusting the pressure point on a Magura brake lever



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.

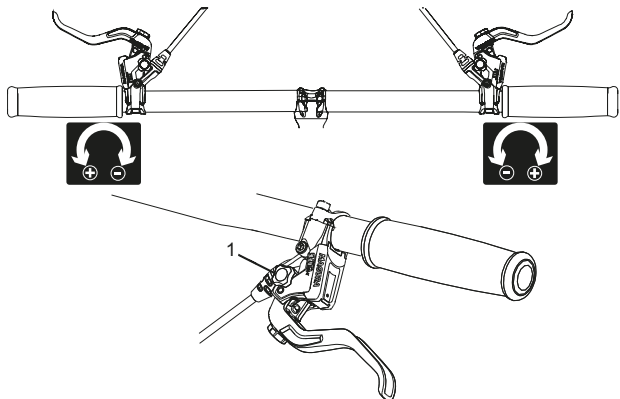


Figure 39: Using the twist knob (1) to adjust the pressure point

6.3.2

Adjusting the grip distance



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.

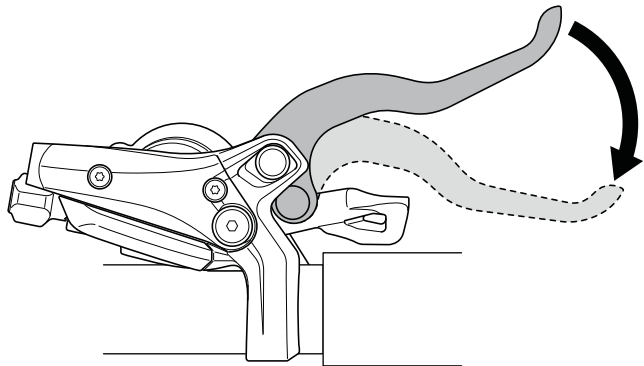


Figure 40:

Brake lever grip distance

6.3.2.1**Adjusting the grip distance on a Magura brake lever
Alternative**

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.

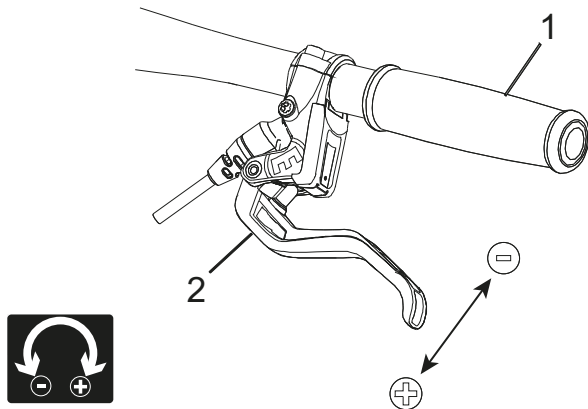


Figure 41:

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

6.4

Adjusting the suspension



CAUTION

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 bicycle 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.

6.4.1

Adjusting the negative deflection

Negative deflection is compression caused by the rider's weight, including equipment (such as a backpack), sitting position and frame geometry.

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

6.4.1.1

Adjusting the steel suspension fork negative deflection

Alternative

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 bicycle.



Figure 42:

Negative deflection setting wheel on the suspension fork crown

- ✓ Only adjust the negative deflection when the bicycle is stationary.
- ▶ 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.
- ▶ If applicable, re-attach the plastic cover after setting the suspension fork.

6.4.1.2

Adjusting the air suspension fork negative deflection *Alternative*

NOTICE

Riding without filling pressure will destroy the wheel suspension, the frame and the air suspension elements.

- ▶ Never ride without filling pressure in the air suspension elements.

NOTICE

A normal air pump cannot build up the required pressure with sufficient sensitivity.

- ▶ Use a special damper pump to adjust the filling pressure.

The air chamber valve can be used to adjust the fork suspension to the rider's weight and driving style.

Adjusting the tyre pressure

- ▶ The tyre pressure determines the force required to press the fork together. If the tyre pressure is reduced, the fork slackens more and rebounds less.



Figure 43:

Screw caps in different designs

- ✓ Only adjust the tyre pressure when the bicycle is stationary.

- ▶ The air valve is located under a screw cap on the head of the left shock absorber. Unscrew and remove the screw cap.
- ▶ Adjust the air pressure as an initial value using a high-pressure damper pump and based on the tyre pressure table on the fork and the rider's weight.

6.5

Retracting the brake linings

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

- ▶ Accelerate bicycle to about 25 km/h.
- ▶ Brake bicycle 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.

7

Operation



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.
-



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 bicycle on a flammable surface (grass, wood, etc.) directly after use.
-



Crash caused by soiling

Heavy soiling can impair the functions of the bicycle, for example, the function of the brakes. 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.
-



When riding downhill, high speeds may be reached. The bicycle is only engineered for exceeding a speed of 25 km/h briefly. The *tyres* in particular can fail if exposed to a continuous load.

- ▶ Decelerate the bicycle with the brakes if higher speeds than 25 km/h are reached.
-

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 bicycle in the sun.
- ▶ On hot days, regularly check the *tyre pressure* and adjust it as necessary.

You can be ride the bicycle 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

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

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



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 condition of the roads.

7.1

Before each ride



Crash caused by difficult-to-spot damage

If the bicycle 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 bicycle 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 bicycle from service immediately in case of 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 inspects the bicycle 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 to strong heat sources.
-

7.2

Check list before each ride

► Check the bicycle before each ride.

⇒ Do not use the bicycle if there are any anomalies.

<input type="checkbox"/>	Check that the bicycle is complete.
<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 bicycle has 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, operate the brake levers while stationary in order 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 riding 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 bicycle's lower surfaces.
<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.

7.3

Charger



Risk to life due to failure of pacemakers

The magnetic connections in the charger may affect the function of pacemakers.

- ▶ Never stand in proximity to the magnetic connections with a pacemaker.
-



Fire and electric shock

If the charger's supply voltage exceeds the value specified in the technical data, an electric shock or fire in the charger may occur.

- ▶ Never use excessive supply voltage.

Never burn a faulty charger or battery.

- ▶ Never leave the battery unattended during charging.
 - ▶ Before charging the battery, check for visible damage, such as cracks or burn marks.
 - ▶ All charger and battery connections must be clean.
 - ▶ Never use or charge damaged batteries!
-



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.
-



Electric shock caused by penetration by water

There is a risk of electric shock if it is penetrated by water.

- ▶ Never allow the charger to come into contact with water or moisture. If there is reason to believe that water may have entered into the battery, the battery must be removed from service.
-



Danger of electric shock

The charger is live during operation. Incorrect use may cause electric shock.

- ▶ Never open the charger.
- ▶ The charger, cable and connector must be checked before each use. Never use if damage is detected.
- ▶ Always keep the charger clean.



Fire and burning caused by overheated charger

During charging, the charger becomes very hot. There is a risk of fire or burning during and shortly after use.

- ▶ During charging, keep the charger away from flammable materials. Only use the charger in a dry, fireproof place.
 - ▶ Handle the charger carefully during and after charging. The charger may be hot.
 - ▶ Never leave the charger unattended during charging. After charging, remove the device from the mains and allow to cool.
-

7.3.1

Connecting the charger to the mains

- ▶ Connect the mains plug on the connecting cable to the power jack on the charger. Connect the mains plug (country-specific) on the connecting cable to the power supply.

Nominal input voltage	100 ... 240 V AC
Frequency	50 ... 60 Hz

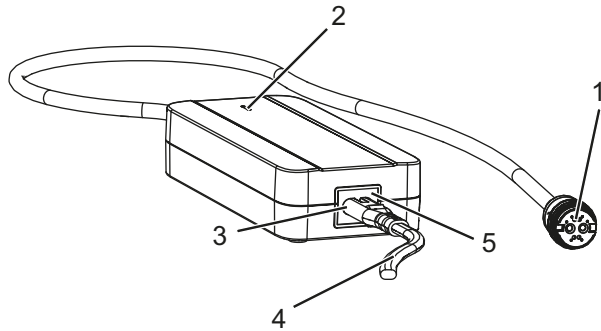


Figure 44:

Charger with mains plug (1), LED display charger (2), mains plug (3), connection cable (4) and power jack (5)

7.4

Rechargeable battery



Risk to life due to failure of pacemakers

The magnetic connections in the battery may affect the function of pacemakers.

- ▶ Never stand in proximity to the magnetic connections with a pacemaker.



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.

- ▶ Remove batteries with external damage from service immediately and never charge them.
 - ▶ 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.
 - ▶ 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 the battery in a dry place until disposal. Never store in the vicinity of flammable substances.
 - ▶ Never open or repair the battery.
-



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.



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.



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.
-



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 and these operating instructions clearly to prevent mix-ups – with the bicycle *frame number* or *type number*, for example .



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.

NOTICE

If a key is left inserted when transporting the bicycle, or when riding, it may break off or the compartment 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.

7.4.1

Charging the battery



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.
-



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 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.
-

**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.

**CAUTION**

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 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 0 °C to +45 °C. The battery cannot be charged at a temperature outside of the permitted charging temperature, even when connected to the charger. It can only be charged again when the permitted charging temperature is reached.
 - ✓ The battery can remain in the drive unit or be removed for charging.
 - ✓ Interrupting the charging process does not damage the battery.

7.4.1.1

Charging the battery in the drive unit

- ▶ Insert the charger plug into the charging socket on the battery used in the drive unit.

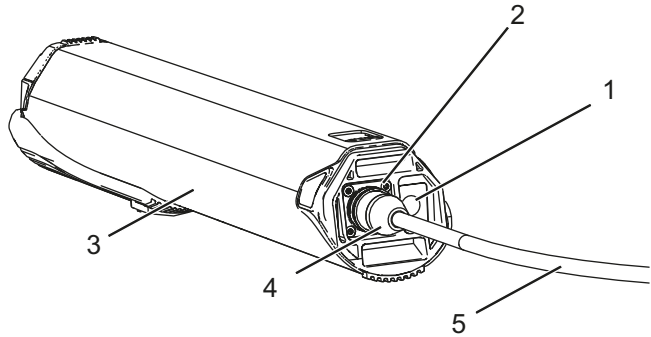


Figure 45:

Drive unit with battery level indicator (1), charging socket (2), drive unit with battery (3), charger plug (4) and connection cable (5)

- ⇒ Charging begins as soon as the charger plug is connected to the charging socket on the connected battery.
- ⇒ The charge level is displayed by the battery level indicator on the battery. Every LED represents 20% of the capacity. Once 5 LEDs are illuminated, the battery is completely charged.
- ⇒ Once the battery is fully charged, the LEDs on the battery level indicator go out. You can check the charge level by briefly pressing the On-Off button on the battery.
- ▶ Once charging is complete, unplug the charger from the mains and the battery from the charger.

7.4.1.2

Charging the battery on the bicycle

- ✓ The drive unit is located on the bicycle.
- ▶ Connect the charger plug to the bicycle charging socket.

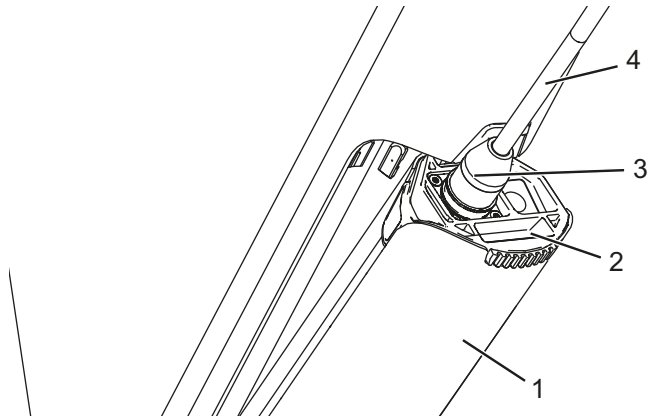


Figure 46:

Drive unit (1) with battery level indicator (2), charger plug (3) and connection cable (4)

- ⇒ Charging begins as soon as the charger plug is connected to the charging socket on the connected battery.
- ⇒ The charge level is displayed by the battery level indicator on the battery. Every LED represents 20% of the capacity. Once 5 LEDs are illuminated, the battery is completely charged.
- ⇒ Once the battery is fully charged, the LEDs on the battery level indicator go out. You can check the charge level by briefly pressing the On-Off button on the battery.
- ▶ Once charging is complete, unplug the charger from the mains and the battery from the charger.

7.4.2

Inserting the battery into the drive unit

NOTICE

Dirt causes friction when inserting the battery into the drive unit and complicates the process.

- ▶ Always clean the battery (1) and drive unit (2) before use and maintain a clean condition.

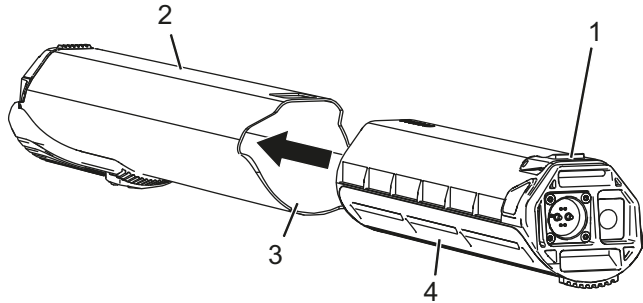


Figure 47:

Inserting the battery into the drive unit

- ▶ To insert the battery (4) into the drive unit (2), hold the drive unit (2) in one hand and the battery (4) in the other. Make sure that the discharging socket is positioned towards the battery holder (3).
- ▶ Connect the two components by carefully inserting the battery (4) into the battery holder (3) on the drive unit (2).
- ▶ Once the battery (4) is fully inserted, the battery (4) is automatically locked by the battery lock (1).

7.4.3

Removing the battery from the drive unit

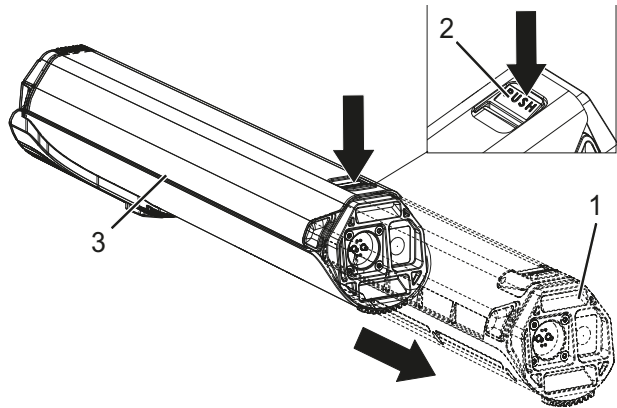


Figure 48: Removing the battery from the drive unit

- ▶ To remove the battery (1) from the drive unit (3), press the battery lock (2) whilst simultaneously pulling out the battery (1) from the battery holder.

7.5

Drive unit

7.5.1

Installing the drive unit on the bicycle

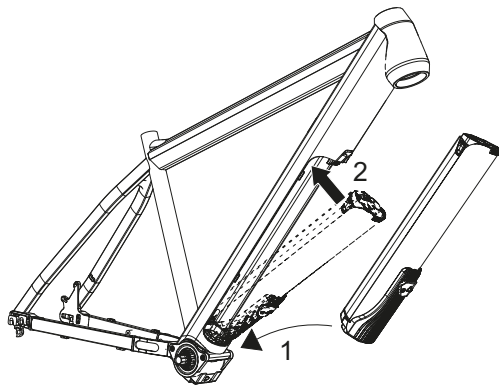


Figure 49: Installing the drive unit on the bicycle

- ✓ A charged battery must be inserted in the drive unit.
- ▶ (1) Position the interface to the bottom bracket axle directly under the down tube on the bicycle, in front of the free interface on the bottom bracket axle.
- ▶ (2) Swing the upper end of the drive unit into the down tube until the locking hook engages.
- ▶ Check that the drive unit is firmly attached.

Lock the drive unit to protect it against theft.

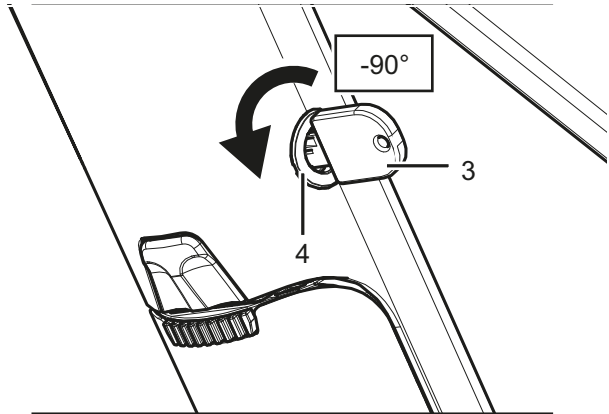


Figure 50:

Locking the drive unit

- ▶ Insert the lock (3) into the cylinder (4).
- ▶ Turn the key (3) anti-clockwise.

7.5.2

Removing the drive unit from the bicycle**NOTICE**

- ▶ When removing the drive unit, hold it firmly to prevent it from falling out of the frame.

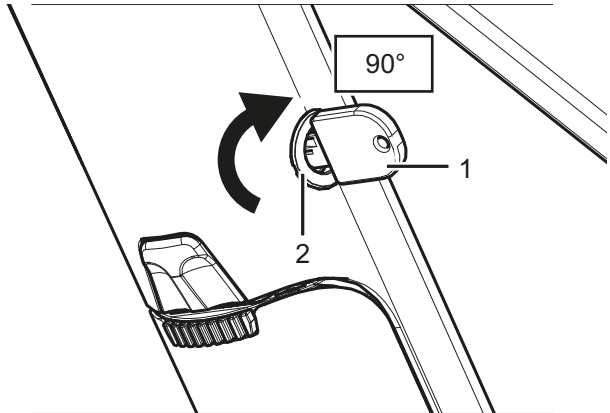


Figure 51:

Unlocking the drive unit

- ▶ Insert the lock (1) into the cylinder (2).
- ▶ Turn the key (1) clockwise.
- ⇒ The drive unit is now unlocked.

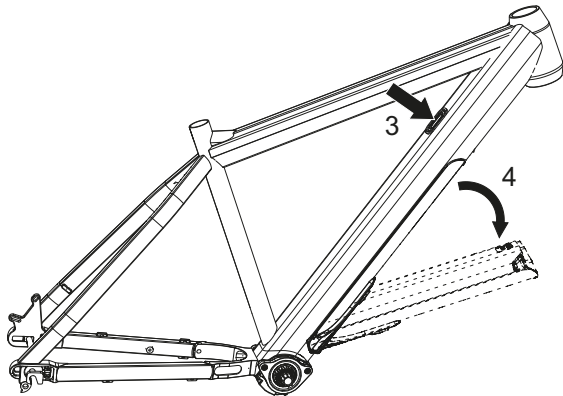


Figure 52:

Removing the drive unit from the bicycle

- ▶ Hold the drive unit firmly with one hand.
- ▶ Press the drive unit firmly against the frame.
- ▶ With the other hand, press the push button (3).
- ▶ Swing the drive unit out of the frame and remove the drive unit.

7.6 Drive system

7.6.1 Switching on the 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 on the bicycle.
 - ✓ The battery is firmly positioned. The key has been removed.
 - ✓ The drive unit has been inserted on the bicycle.
 - ✓ The speed sensor is properly connected to the bottom bracket axle and the spoke magnet is in the correct position.
- ▶ Press any button on the control panel.
- ⇒ The control panel will display the start animation and is ready for operation.

7.6.2 Switching off the drive system

In order to prevent the bicycle from moving unintentionally and to protect the battery, always switch the bicycle off after parking. There are 4 ways to switch the drive system off:

1 Middle button

- ▶ Press and hold the middle button on the control panel for 2 seconds.

2 Drive pack

- ▶ Remove the drive unit from the bicycle.

3 Rechargeable battery

- ▶ Switch the battery off.

4 Standstill

- ▶ Bring the bicycle to a halt.

⇒ The battery level indicator LEDs display a switch-off animation and the battery is switched off.

7.6.3

Drive system standstill

The bicycle shuts down

- ▶ if it has not been moved for 10 hours and no button has been pressed on the control panel or
 - ▶ if the battery level drops below 30%, the bicycle has not been moved for 3 hours and no button has been pressed on the control panel.
- ⇒ If the bicycle is at a standstill, the system automatically switches off the battery.

If your drive system is at a standstill, the battery switches off to conserve the remaining energy.

If the battery is no longer installed in the drive pack or connected to the charger after 12 hours and no button has been pressed on the battery, the battery will switch off to preserve the remaining energy. To start a system that has been shut down, switch the battery on.

7.7

Control panel



Crash caused by distraction

A lack of concentration while riding increases the risk of an accident. This may cause a crash with serious injuries.

- ▶ Never allow yourself to be distracted by the control panel.
-

7.7.1

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 bicycle wheels are not in contact with the ground when the push assist system is used (e.g. when carrying the bicycle up stairs or when loading a bike rack).

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

The push assist helps the rider to push the bicycle. The speed can be a maximum of 6 km/h in this case. The user can slow the bicycle to their own walking pace by holding the bicycle firmly while pushing.

- ▶ Use the control panel to set the pedal assistance to NONE.
- ▶ Press and hold the **bottom button** on the control panel. After 2 seconds, the push assist system is activated.
- ▶ To deactivate the push assist system, release the **bottom button** on the control panel.

7.7.2

Selecting the level of assistance

Press the top or bottom button on the control panel. The following levels of assistance are possible:

Level of assistance	Use
NONE	Motor assistance is deactivated. The bicycle can be used as a normal bicycle.
BREEZE	Low but effective support for maximum range.
RIVER	Reliable assistance for most usage situations.
ROCKET	Maximum assistance for very demanding excursions.

Table 26:

Overview of levels of assistance

Level of assistance	Colour	Max. assistance factor	Max. output
NONE	WHITE	0%	0 W
BREEZE	GREEN	75%	125 W
RIVER	BLUE	150%	250 W
ROCKET	PINK	240%	400 W

7.8

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.

7.8.1

Using the derailleur gears

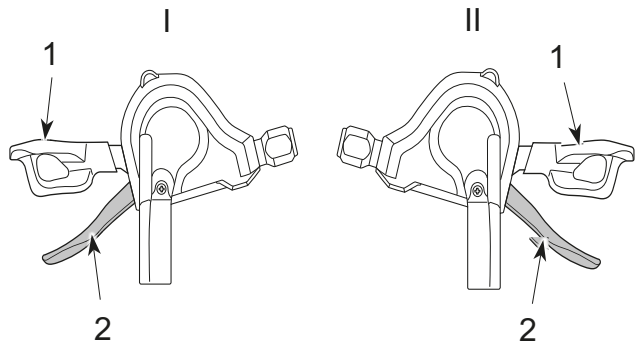


Figure 53:

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.

7.9

Brake



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.

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.



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 brake disc openings.

- ▶ Always keep fingers well away from the rotating brake disc.
-



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.



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.
- ▶ Practise braking and emergency braking before the bicycle is used in public spaces.
- ▶ Never use the bicycle if you can feel no resistance when pulling on the brake handle. Consult a specialist dealer.



Crash after cleaning or storage

The brake system is not designed for use on a bicycle 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 bicycle is placed on its side or turned upside down, apply the brake a couple of times before setting off to ensure that it functions normally.
- ▶ Never use the bicycle if it no longer brakes as normal. 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.
-

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.

7.9.1 Using the brake lever

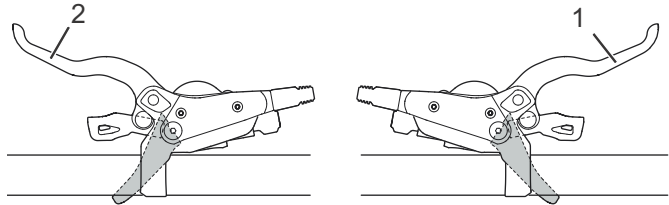


Figure 54: Front (2) and rear (1) brake lever; Shimano brake used as an example

- ▶ 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.

7.10 Suspension and damping

7.10.1 Adjusting the compression of the Suntour fork *Alternative*

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 55: 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.

8 Maintenance

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 they are fully functional	every three months
<input type="checkbox"/>	Check for wear on brake discs	at least every six months

Service check list

<input type="checkbox"/>	Functional check on the suspension fork	every 50 hours
<input type="checkbox"/>	Suspension fork maintenance and dismantling	every 100 hours or at least once a year
<input type="checkbox"/>	Complete maintenance of the rear frame damper	every 125 hours
<input type="checkbox"/>	Inspection by the specialist dealer	every six months
<input type="checkbox"/>	Inspection of the drive unit	15,000 km

8.1

Cleaning and servicing



Crash and falling caused by unintentional activation

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

- ▶ Remove before cleaning.
-

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.

8.1.1

After each ride

8.1.1.1

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.

8.1.1.2

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.

8.1.1.3

Cleaning the pedals

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

8.1.2

Basic cleaning**Crash caused by brake failure**

The braking effect may be unusually poor temporarily after cleaning, servicing or repairing the bicycle. 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 bicycle with a steam jet.

NOTICE

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.
- ✓ Remove battery and display before basic cleaning.

8.1.2.1

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.

8.1.2.2

Cleaning the stem

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

8.1.2.3

Cleaning the rear frame damper

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

8.1.2.4

Cleaning the wheel



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.

8.1.2.5**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.

8.1.2.6**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 dish-washing liquid. Place the cloth on the chain.
 - ▶ Hold with 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 WD40.
 - ▶ Service the chain after cleaning.

8.1.2.7

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.
 - ▶ Never immerse the battery in water.
 - ▶ Never use cleaning agents.
 - ▶ Remove the battery from the bicycle before cleaning.
-
- ▶ Clean the battery electrical connections with a dry cloth or brush only.
 - ▶ Wipe off the decorative sides with a damp cloth.

8.1.2.8

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 bicycle before cleaning.
-
- ▶ Carefully clean the display with a damp, soft cloth.

8.1.2.9

Cleaning the drive unit**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.

All components of the drive system must be kept in a clean condition. Particular attention must be paid to the contacts and interfaces between the battery and the drive unit, and the drive unit and the bottom bracket axle. A clean cooler on the drive unit can fulfil its function better.

- ▶ Clean all components of the drive unit carefully using a soft, damp cloth before each use, leave to dry completely and maintain in a clean condition.
- ▶ The lock should be lubricated every two to three months or as soon as it is no longer easy to open.

For further information concerning the maintenance of your drive system, please contact your specialist dealer or visit the FAZUA service platform at: www.fazua.com/service.

8.1.2.10

Cleaning the brake



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 bicycle with a high-pressure water device or compressed air.
 - ▶ 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.

8.1.3

Servicing

8.1.3.1

Servicing the frame

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

8.1.3.2

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.

8.1.3.3**Servicing the fork**

- ▶ Treat the dust seals with fork oil.

8.1.3.4**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.

8.1.3.5**Servicing the pedals**

- ▶ Treat with spray oil after cleaning.

8.1.3.6**Servicing the chain**

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

8.1.3.7**Servicing the drive elements**

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

8.2

Maintenance



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 [[▶ Check list, page 112](#)]. They can be carried out by the operator and rider. In case of any doubt, consult the specialist dealer.

8.2.1

Wheel



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.
-



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 against the specifications [[▶ Data sheet, page 1](#)]
 - ▶ *Adjust the tyre pressure* as necessary.
-
- ▶ Check the *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.

8.2.2 Checking the tyres

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

8.2.3 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 ZEG specialist dealer.
- ⇒ We recommend that you also replace the *rims* at the same time as every second brake lining replacement.

8.2.4 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 vehicle is used under extreme conditions such as rain, dirt or high mileage, maintenance must be performed more frequently.

8.2.5

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 had, a specialist dealer would need to replace them.

8.2.6

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 specialist dealer needs to vent the brake.

8.2.7

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 had, a ZEG specialist dealer would need to replace them.

8.2.8

Electrical cables and brake cables

- ▶ Check all visible electrical cables and cables for damage. If, for example, the sheathing is compressed, the bicycle 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.

8.2.9

Gear shift

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

8.2.10

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 the instructions.
- ▶ Check for wear and signs of corrosion (maintain with an oily cloth) and for oil leaks.

8.2.11

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 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* will need to be tensioned again by the specialist dealer.
- ▶ If the *chain* or belt can only be pushed up and down less than 1 cm, you will need to slacken the *chain* or belt slightly.

⇒ The ideal chain tension has been achieved if the *chain* or the 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.

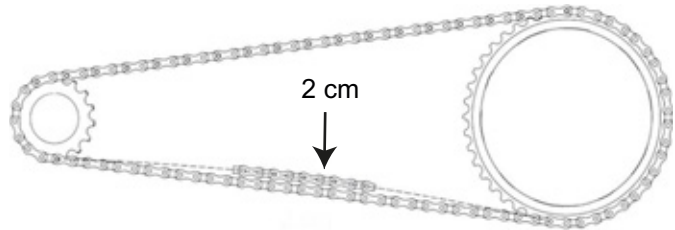


Figure 56: **Checking the chain tension**



▶ 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.

8.2.12 Checking the handlebar grip position

▶ Check the handlebar grip is firmly in position.

8.2.13 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.

8.3**Service**

**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.
-

**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 six-monthly basic cleaning of the bicycle, preferably at the same time as the required servicing work.
-

NOTICE

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

- ▶ Never open the motor.
-

The specialist dealer must perform an inspection at least every six months. This is the only way to ensure that the bicycle remains safe and fully functional.



- ▶ The specialist dealer will inspect the bicycle 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 of air forks, overhaul the air suspension, change the oil and replace the dust wipers.
- ▶ The further servicing measures correspond to those which are recommended for a bicycle as per EN ISO 4210. They will pay particular attention to rim and brake wear. The spokes are re-tightened in accordance with the findings.

8.4

Adjusting and repairing



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.



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.
-

8.4.1

Use original parts and lubricants only

The individual parts of the bicycle have been selected carefully and to matched to each other.

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

The constantly updated lists of approved accessories and parts are available to specialist dealers.

8.4.2

Axle with quick release



CAUTION

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.
-



CAUTION

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.
-



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. 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.
-

8.4.2.1

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 57:

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.

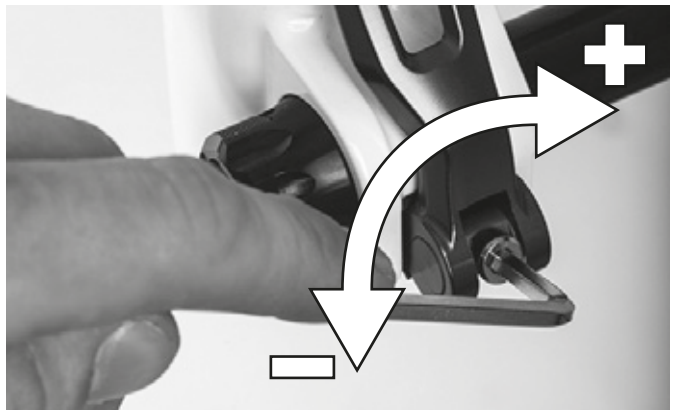


Figure 58:

Adjusting the quick release clamping force

8.4.3

Adjusting the tyre pressure

8.4.3.1

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.
- ⇒ The tyre pressure has been adjusted as per the data [▷ *Data sheet, page 1*].
- ▶ 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.



Figure 59:

Dunlop valve with union nut (1) and rim nut (2)

8.4.3.2

Presta 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.
- ▶ 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 data [[Data sheet, page 1](#)].
- ▶ 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.

Figure 60:

Presta valve with valve insert (1), knurled nut (2) and rim nut (3)

8.4.3.3

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 data [[▷ Data sheet, page 1](#)].
- ▶ Remove the bicycle pump.
- ▶ Screw the valve cap tight.
- ▶ Screw the rim nut gently against the rim with the tips of your fingers.



Figure 61:

Schrader valve with rim nut (1)

8.4.4

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.



If you are unable to adjust the gear shift in this way, the specialist dealer will need to check the gear shift assembly.

8.4.5

Cable-operated gear shift, single-cable *Alternative*

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

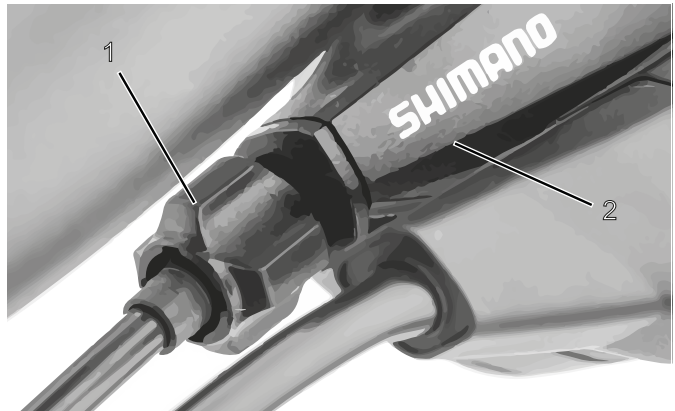


Figure 62:

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

8.4.6

Cable-operated gear shift, dual-cable *Alternative*

- ▶ 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.

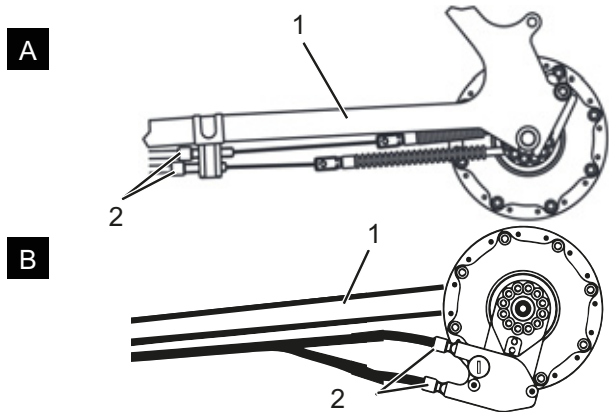
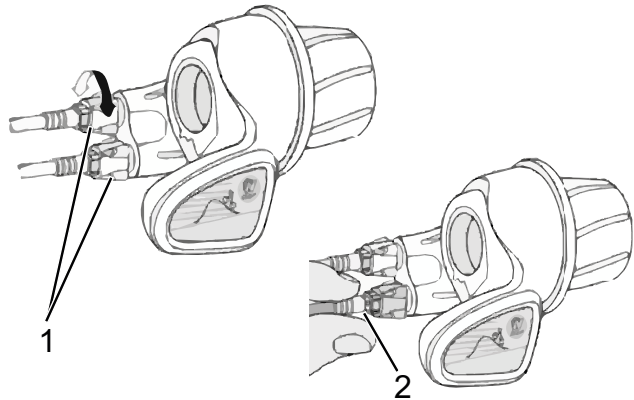


Figure 63: Adjusting sleeves (2) on two alternative versions (A and B) of a dual-cable, cable-operated gear shift on the chain stay (1)

8.4.7**Cable-operated twist grip, dual-cable
Alternative**

- ▶ 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 64:****Twist grip with adjusting sleeves (1) and play of the gear shift (2)**

8.4.8

Brake



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.



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.



Special tools, special lubricants and knowledge of suspension components are required to maintain and repair brake discs, such as venting brakes or replacing the brake discs. The brakes may become damaged if procedures are not followed as described. Only ZEG specialist dealers may carry out maintenance on brakes. You will find the maintenance and repair instructions at:

www.kettler-alu-rad.de/de/de/index/service/anleitung

8.4.9

Replacing the lighting

Alternatively a 3 watt or 1.5 watt lighting system can be installed.

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

8.4.10

Setting the headlight

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

8.4.11

Repair by the specialist dealer



Special knowledge and tools are required for many repairs. Only a specialist dealer may carry out the following repairs, for instance:

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

8.4.12

Initial help



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 respective status message appears on the control panel. The drive may be shut off automatically, depending on the type of error.

Status screen

The status screen on the control panel indicates a status change or an existing fault. The status indicator does not light up if no fault is detected. The different colours of the status screen have the following meaning:

Colour	Meaning
Green	The status screen briefly flashes green after the drive pack has been successfully installed in the bicycle. This gives you a visual signal that the system can now be switched on.
Yellow	The status screen briefly turns yellow when a "soft fault" is detected. This means that there is a temporary or non-critical disturbance, which in most cases leads to a loss of performance. In the event of a "soft fault", you can still ride your bicycle. However, this is not recommended.
Red	The status screen briefly turns red when a "hard fault" is detected. In the event of a "hard fault", the bicycle cannot be operated and must be serviced.

Table 27:

Meaning of status screen colours

- ▶ Please contact your specialist dealer immediately in the case of an ongoing "soft fault" or a "hard fault".



"Soft faults" on the bicycle are most commonly caused by missing data from the speed sensor.

In the case of a permanent "soft fault", you can re-install the speed sensor magnets. If the problem persists, please contact your FAZUA service partner or visit the FAZUA service platform (www.fazua.com/service).

For a permanent "hard fault", please contact your FAZUA service partner or visit the FAZUA service platform (www.fazua.com/service)

8.4.13

Drive system or control panel does not start up

If the control panel 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.
- ▶ Contact your specialist dealer if the drive system does not start up.

8.5

Accessories

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

<i>Description</i>	<i>Article number</i>
Teddy child seat	08947-665
Flipper child seat	08947-660
Fitting stand	08981-880
Wall mount	08959-000
Ceiling mount	08959-500
Parking stand	08982-500
Messenger bag	08987-742
Layana shopping bag	08987-741
Pannier rack basket	08985-500
Smart bag	08987-745
Single bag	08987-746
Handlebar bag	08987-747
Smart Bag Waterproof	08987-748
Single Bag Waterproof	08987-749
Business bag	08987-744
Ladies' bag	08987-743

Table 28:

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.

8.5.1

Child seat



Crash caused by incorrect child seat

Neither the pannier rack nor the bicycle 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.
-



Crash caused by improper handling

When using child seats, the riding properties and the stability of the bicycle change considerably. This can cause a loss of control, a crash and injuries.

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



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.
-



- ▶ Observe the legal regulations on the use of child seats.

- ▶ Observe the operating and safety instructions for the child seat system.

- ▶ Never exceed the total weight of the bicycle.
-



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

The specialist dealer must install 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 bicycle 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 bicycle's permitted total weight is not exceeded.

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

8.5.2

Bicycle trailers



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.
- ▶ 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 bicycle which is approved for towing a trailer is equipped with the relevant information sign. Only bicycle trailers with a support load and total mass

which do not exceed the permitted values may be used.

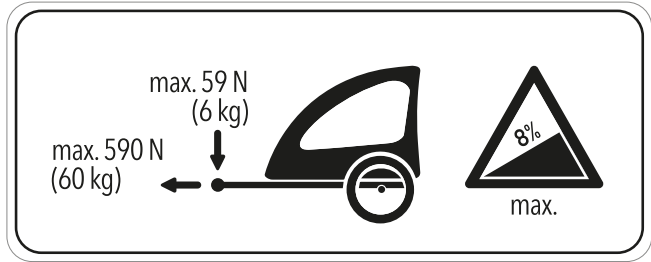


Figure 65:

Trailer sign



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

8.5.3

Pannier rack



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

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

When installing a pannier rack, the specialist dealer makes sure that the fastening mechanism for the rack is suitable for the bicycle 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 bicycle is not exceeded.

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

9

Recycling and disposal



Risk of fire and explosion

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

- ▶ Remove batteries with external damage from service immediately and never charge them.
- ▶ 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 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.



Chemical burns to the skin and eyes

Liquids and vapours may leak from damaged or faulty batteries. 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.
-



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 accumulators (Directive 2006/66/EC). The directive provides the framework for the EU-wide return and recycling of used devices, which are collected separately and in an environmentally sound manner. The bicycle, battery, motor, display and charger are recyclable materials. You must dispose of and recycle them separately from domestic waste in compliance with the 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 bicycle, battery or charger for disposal.
- ▶ The bicycle, display, the unopened, 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 bicycle in a dry place, free from frost, where they are protected from direct sunlight.

10

10.1

Appendix

EC declaration of conformity

Translation of the original EC declaration of conformity

The manufacturer:

KETTLER Alu-Rad GmbH
 Longericher Str. 2
 50739 Köln

hereby declares that the electrically power assisted cycles of types:

KC156-VAKxxx, KC174-VBKxxx, KC157-VAFxxx, KC158-VAKDxx

year of manufacture 2018 and year of manufacture 2019,

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 used: **EN ISO 12100:2010** Safety of machinery – General principles of design – Risk assessment and reduction, **EN 15194:2015**, Cycles – Electrically power assisted cycles – EPAC bicycles, **EN ISO 4210**, Cycles – Safety requirements for bicycles, **EN 11243:2016**, Cycles – Luggage carriers for bicycles – Requirements and test methods and **EN 82079 1:2012**, Preparation of instructions for use – Structuring, content and presentation – Part 1: General principles and detailed requirements.

Ms. Janine Otto (Technical Editor), c/o KETTLER Alu-Rad GmbH, Longericher Str. 2, 50739 Köln, is authorised to compile the technical documentation.



Cologne, 14/11/2018

Place, date and signature

Egbert Hageböck
 -Managing Director-

10.2 Parts list

Model	2° E Pro Street
Type numbers	KC156-VAKxxx
Wheel size	28"
Frame shapes	Diamond
Frame sizes	47cm
Drive	Chain drive
Motor	Fazua drivepack
Gears	Shimano XT 11-gear derailleur
Brakes	Shimano BR-MT 400, hydraulic disc brake
Rechargeable battery	Fazua in-tube battery
Charger	Fazua charger
Stem	Kalloy AS-007N
Fork	Suntour NCX-AIRLO 63 mm
Seat post	Kalloy SP-368, patented post
Tyres	Schwalbe Marathon GT Tour

Table 29: 2° E Pro Street parts list

Model	2° E Pro Street S
Type numbers	KC174-VBKxxx
Wheel size	28"
Frame shapes	Diamond
Frame sizes	47cm
Drive	Chain drive
Motor	Fazua drivepack
Gears	Shimano XT 11-gear derailleur
Brakes	Shimano BR-MT 400, hydraulic disc brake
Rechargeable battery	Fazua in-tube battery
Charger	Fazua charger
Stem	Kalloy AS-007N
Fork	Suntour NCX-AIRLO 63 mm
Seat post	Kalloy SP-368, patented post
Tyres	Schwalbe Marathon GT Tour

Table 30: 2° E Pro Street S parts list

Model	2° E Pro 5
Type numbers	KC157-VAFxxx
Wheel size	28"
Frame shapes	Diamond
Frame sizes	47cm
Drive	Hub gear
Motor	Fazua drivepack
Gears	Shimano Nexus Inter 5E
Brakes	Shimano BR-MT 400, hydraulic disc brake
Rechargeable battery	Fazua in-tube battery
Charger	Fazua charger
Stem	Kalloy AS-007N
Fork	Suntour NCX-AIRLO 63 mm
Seat post	Kalloy SP-368, patented post
Tyres	Schwalbe Marathon GT Tour

Table 31: 2° E Pro 5 parts list

Model	2° E Pro Cross
Type numbers	KC158-VAKDxx
Wheel size	28"
Frame shapes	Diamond
Frame sizes	47cm
Drive	Chain drive
Motor	Fazua drivepack
Gears	Shimano XT 11-gear derailleur
Brakes	Shimano BR-MT 400, hydraulic disc brake
Rechargeable battery	Fazua in-tube battery
Charger	Fazua charger
Stem	Kalloy ML-2; monkeylink ready
Fork	Suntour NCX-AIRLO 63 mm
Seat post	Kalloy SP-368, patented post
Tyres	Schwalbe Marathon GT Tour

Table 32: 2° E Pro Cross parts list

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