OPERATING AND MAINTENANCE INSTRUCTIONS

IMPORTANT

READ CAREFULLY BEFORE USE

KEEP SAFE TO CONSULT AT A LATER DATE

S pedelec

KETTLER Velossi 2.0

K01

Contents

1 About these operating instructions

Thank you for your trust!

KETTLER *S pedelecs* are premium quality vehicles. You have made an excellent choice. Your specialist dealer will provide you with guidance and instruction and assemble your product. Your specialist dealer will also be happy to assist you in the future, whether you require maintenance, conversion or repair.

Notice

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

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

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

The operating instructions are mainly designed for the rider or the operator. They aim to ensure that non-professionals can use the S pedelec safely.

Sections are also designed especially for the specialist dealer. These sections aim to ensure that specialist dealers complete initial assembly and maintenance safely and reliably. The sections for specialist dealers are highlighted in grey and marked with a spanner symbol.

Download the operating instructions onto your phone at the following link, so that you can use them when you are out riding:

https://www.kettler-alu-rad.de/gb/en/index/service.html

1.1 Manufacturer

The S pedelec manufacturer 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
Website: www.kettler-alu-rad.de

1.2 Type number and model

These operating instructions are an integral part of S pedelecs with the type numbers:

Type no.	Model	Type
K01	Bulls Twenty 8 EVO 45	City and trekking bicycle

1.3 Identifying the operating instructions

You will find identification number at the bottom left-hand side of each page. The identification number is composed of the document number, the version number and the release date.

Identification number	MY20K10-02 _1.0_10.11.2020

Table 1: Identification number

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 published version of the *operating instructions*. You will find any modifications to these *operating instructions* at:
https://www.kettler-alu-rad.de/gb/en/index/service.html.

1.5 Laws, standards and directives

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

- EC Directive No. 168/2013
- Electromagnetic Compatibility Directive 2014/30/EU
- EN 82079- 1:2018 Preparation of instructions for use – Structuring, content and presentation – Part 1: General principles and detailed requirements and
- ISO 17100:2016-05 Translation Services – Requirements for translation services.

1.6 For your information

Different markings are used in the operating instructions to make them easier to read.

1.6.1 Warnings

Warnings indicate hazardous situations and actions. You will find warnings in the *operating instructions*:

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

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

Notice

May lead to material damage if ignored.

1.6.2 Markups

You will find stylised forms of typeface in the *operating instructions*:

Stylised form	Use
Italics	Glossary term
Underlined in blue	Link
▶⇔◀⇨△▽◀△↓⇨↑⇨ ⇔ →△⇨▶	Cross references
✓ Check marks	Requirements
▶ Triangle	Instruction for action
1 Instruction for action	Several instructions for action in specified order
⇨	Result of the action
SPACED	Indicators on the display screen
•	Bulleted lists
Only applies to S pedelecs with this equipment	Each type has a different kind of equipment. A note beneath the heading indicates components which can be used as an alternative.

Instructions for specialist dealers are highlighted in grey. They are indicated by a screwdriver symbol. Information for specialist dealers does not require non-professionals to take any action.

2 Safety

2.1 Residual risks

2.1.1 Risk of fire and explosion

2.1.1.1 Rechargeable 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.

- ▶ Only use and charge the battery and accessories if they are in perfect condition.
- ▶ Never open or repair the battery.
- ▶ Batteries with external damage must be removed from service immediately.
- ▶ If a battery is dropped or struck, remove it from service and observe it for at least 24 hours.
- ▶ Faulty batteries are hazardous goods. Dispose of faulty batteries in the correct manner. Store battery in a dry place until disposal. Never store in the vicinity of flammable substances.

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

- ▶ Never immerse the battery in water.
- ▶ Put battery out of service if you suspect water has penetrated it.

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

- ▶ Protect the battery against heat.
- ▶ Never store next to hot objects.
- ▶ Never expose the battery to sustained direct sunlight.
- ▶ Avoid wide temperature fluctuations.

Chargers with excessive voltage damage batteries. This may result in fire or an explosion.

- ▶ Only use batteries approved for the S pedelec. Clearly label the supplied charger.

2.1.1.2 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 charger on a highly flammable surface.
- ▶ Never cover the charger during charging.
- ▶ Never leave the battery unattended during charging.

2.1.1.3 Hot components

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

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

2.1.2 Electric shock

2.1.2.1 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.

2.1.2.2 Water penetration

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

- ▶ Never charge the battery outdoors.

2.1.2.3 Bridging

Metal objects may interconnect the battery's electrical terminals. The battery may self-ignite and explode.

- ▶ Never insert paper clips, screws, coins, keys and other small parts into the battery.

2.1.3 Risk of a crash

2.1.3.1 Incorrect quick release setting

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

2.1.3.2 Incorrect tightening torque

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 tightening torque indicated on the screw and in the *operating instructions*.

2.1.4 Risk of amputation

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 discs.

2.1.5 Malfunctions due to Bluetooth®

If you use the on-board computer with Bluetooth® and/or Wi-Fi, it may cause interference with other devices, other equipment, aircraft, and medical devices, such as pacemakers and hearing aids.

Likewise, harm to people and animals in the immediate vicinity cannot be completely excluded.

- ▶ Never use the on-board computer with Bluetooth® when in close proximity to medical devices, filling stations, chemical plants, areas at risk of explosion and in blasting zones.
- ▶ Never use the on-board computer with Bluetooth® in aircraft.
- ▶ Avoid operating for longer periods in close proximity to the body.

2.1.6 Key breaking off

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

- ▶ Remove the key to the battery lock.

2.2 Toxic substances

2.2.1 Brake fluid

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

- ▶ Never dismantle the brake system.
- ▶ Avoid contact with skin.
- ▶ Do not inhale vapours.

2.2.2 Defective battery

Liquids and vapours may leak from damaged or faulty batteries. Excessively high temperatures may also cause liquids and vapours to leak from the battery. Such liquids and vapours can irritate the airways and cause burns.

- ▶ Never dismantle the battery.
- ▶ Avoid contact with skin.
- ▶ Do not inhale vapours.

2.3 Requirements for the rider

The rider must demonstrate adequate physical, motor and mental abilities to ride on public roads. A minimum age of 14 years is recommended.

2.4 Vulnerable groups

Keep batteries and charger away from children and people with reduced physical, sensory or mental capabilities or lacking in experience and knowledge.

If minors use the S pedelec, a legal guardian must should provide them with comprehensive instructions.

2.5 Personal protective equipment

Wear a suitable cycling helmet, sturdy footwear and typical close-fitting clothing to provide protection.

2.6 Safety markings and safety instructions

The nameplate contains these safety markings and safety instructions:

Symbol	Explanation
	General warning
	Adhere to the instructions for use

Table 2: Meaning of safety markings

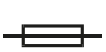
Symbol	Explanation
	Read the instructions
	Separate collection of electrical and electronic devices
	Separate collection of ordinary and rechargeable batteries
	Must not be thrown into fire (burning prohibited)
	It is forbidden to open any batteries
	Device of protection class II
	Only suitable for use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

Table 3: Safety instructions

2.7 What to do in an emergency

2.7.1 Dangerous situation in road traffic

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

2.7.2 Leaked brake fluid

▶ Remove those affected from the danger area to fresh air.

▶ Never leave those affected unattended.

▶ Immediately remove any clothing items contaminated with brake fluid.

▶ Never inhale vapours. Ensure sufficient ventilation.

▶ Wear gloves and safety gloves as protective equipment.

▶ Keep unprotected persons away.

▶ Take care with leaked brake fluid as it poses a slip hazard.

▶ Keep leaked brake fluid away from naked flames, hot surfaces and sources of ignition.

▶ Avoid contact with skin and eyes.

After inhalation

▶ Take in fresh air. Immediately consult a doctor in case of any discomfort.

After skin contact

▶ Wash affected skin with soap and water and rinse well. Remove contaminated clothing. Consult doctor in the event of 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. Immediately consult a doctor in case of any pain or discomfort.

After swallowing

▶ Rinse out mouth with water. Never induce vomiting. Risk of aspiration!

▶ If a person is lying on their back and vomiting, place them in the recovery position. Seek medical advice immediately.

Environmental protection measures

▶ Never allow brake fluid to flow into the sewage system, water courses or groundwater.

▶ Notify the relevant authorities if fluid penetrates the ground, water courses or the sewage system.

▶ Consult a doctor immediately in the event of any pain or discomfort caused by combustion gas or leaking fluids.

2.7.3 Battery vapours emitted

Vapours may be emitted if the battery is damaged or used improperly. The vapours may cause respiratory tract irritation.

▶ Get into fresh air.

▶ Consult doctor in the event of pain or discomfort.

After contact with eyes

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

After skin contact

▶ Remove any solid particles immediately.

▶ Rinse the affected area with plenty of water for at least 15 minutes. Then dab the affected skin gently. Do not rub dry.

▶ Remove contaminated clothing immediately.

▶ Immediately consult a doctor if there is any redness, pain or discomfort.

2.7.4 Battery fire

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.

1 Keep your distance if the battery becomes deformed or starts to emit smoke.

2 If charging, remove the plug connector from the socket.

3 Contact the fire service immediately.

▶ Use Class fire extinguishers to put out the fire.

▶ Never extinguish damaged batteries with water or allow them to come into contact with water.

Inhaling vapours can cause intoxication.

▶ Stand on the side of the fire where the wind is blowing from.

▶ Use breathing apparatus if possible.

2.7.5 Leaked brake fluid

The brake system must be repaired immediately if brake fluid leaks out. Dispose of leaking brake fluid in an environmentally responsible way in accordance with statutory regulations.

▶ Contact your specialist dealer.

3 Overview

Figure 1: S Pedelec viewed from the right, KETTLER Velossi 2.0

1	*Front wheel*	10	Pannier rack
2	*Fork*	11	Rear guard
3	Front guard	12	Rear and number plate light
4	Horn	13	Number plate
5	Headlight	14	Kickstand
6	*Stem*	15	Chain
7	Frame	16	*Battery and nameplate*
8	Seat post		
9	Saddle		

3.1 Description

3.1.1 Wheel

The S pedelec has two wheels: a front wheel and a rear wheel.

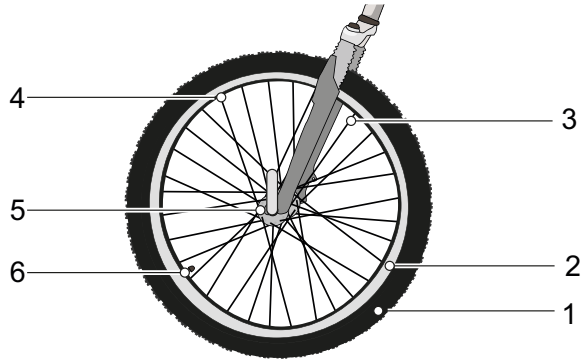


Figure 2: Visible Wheel components, example of front wheel

1 Tyres
2 Rim
3 Spoke
4 Spoke nipples
5 Hub
6 *Valve*

3.1.1.1 Valve

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

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

3.1.2 Suspension

Both forks and suspension forks are fitted in this model series.

3.1.2.1 Rigid fork

Rigid forks do not feature suspension. They transfer the used muscle and motor power to the road to optimum effect. S Pedelecs with rigid forks consume less energy on steep roads and have a greater range than S pedelecs with adjusted suspension.

3.1.2.2 Suspension fork

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. The suspension prevents an impact, such as one caused by a stone lying in the S pedelec'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.

Figure 3: S pedelec without suspension (1) and with suspension (2)

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.

The compression can be disabled in any suspension fork. A suspension fork will then behave like a rigid fork.

3.1.2.3 Air suspension fork

The air suspension fork features air suspension and a compression damper plus a rebound damper in some cases.

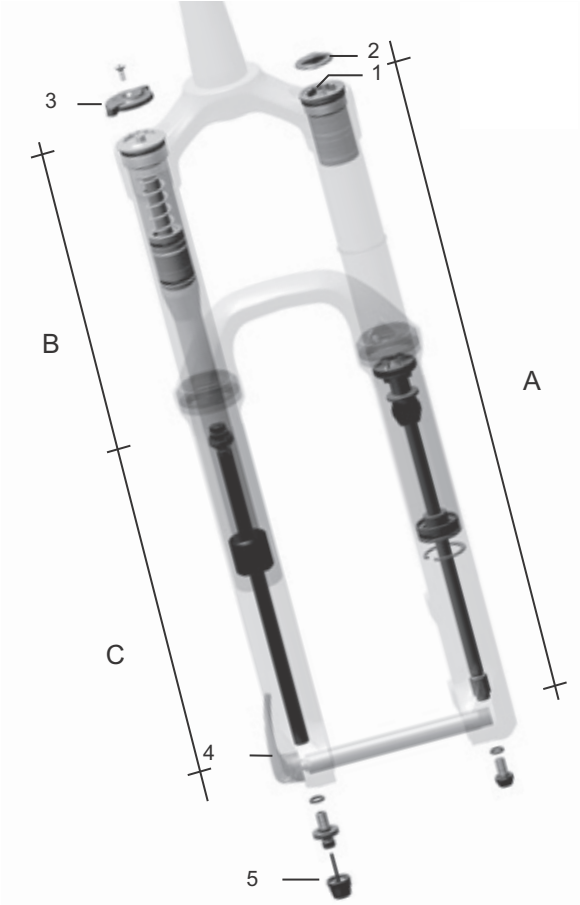


Figure 4: Suntour Mobie 45l

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

3.1.3 Brake system

Every S pedelec has a hydraulic brake system. The brake fluid is in a closed hose system. If the rider pushes the brake lever, the brake fluid activates the brake on the wheel. The mechanical brakes are used as an emergency stop system and bring the S pedelec to a halt quickly and safely in the event of an emergency.

3.1.3.1 Disc brake

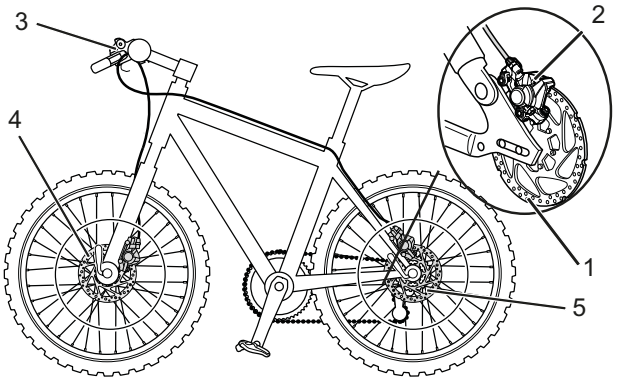


Figure 5: Brake system with disc brake

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

The brake disc is screwed permanently to the wheel *hub* on an S pedelec. The *brake lever* is pushed to increase brake pressure. The brake fluid is used to transfer pressure through the brake cables 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. The fluid level in the hydraulic brake system can be checked via an inspection window on the brake lever.

Figure 6: Fluid level check inspection window

3.1.4 Electric drive system

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

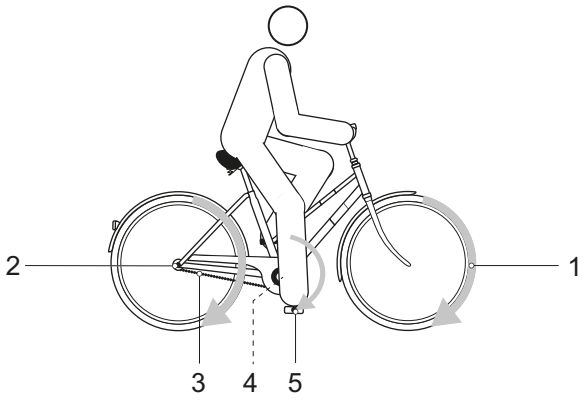


Figure 7: Diagram of mechanical drive system

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

The S pedelec also has an integrated electric drive system.

The electric drive system is made up of 8 components:

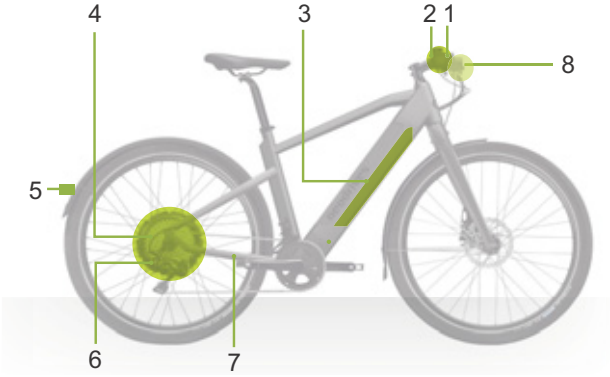


Figure 8: Diagram of electric drive system

1 Control panel
2 *Display*
3 Integrated battery
4 *Rear motor*
5 Rear light
6 Torque support
7 Cable harness
8 A charger which is designed for the battery.

3.1.4.1 Motor

The S pedelec has a gearless wheel hub motor. As soon as the required muscle power from the rider pedalling passes a certain level, the motor is activated gently and assists the rider's pedalling motion. The motor force is determined by the set level of assistance.

The S pedelec does not have a separate emergency stop or emergency shut-off button. The drive system can be stopped in case of emergency by removing the *display*.

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 45 km/h has been reached.

This provides protection against premature power reduction during long climbs and with heavy loads, longer assistance on inclines, greater efficiency and, consequently, less battery consumption as the motor is cooled to an optimum extent.

Just like all drives, gearless wheel hub motors are optimised to an operating point consisting of speed, load and power. The S pedelec wheel hub motor is designed to operate within a speed range between 20 km/h and 45 km/h and a drive power output of 500 W. The motor achieves its optimum efficiency and range within this speed and output range. This means that the electrical energy supplied from the battery is optimally converted into electrical drive energy. A motor's efficiency decreases whenever it is not operated at its optimum operating point. As a result, the electrical energy is no longer converted to an optimum degree since part of the supplied energy is converted into heat instead. This reduces the range and the heat needs to be dissipated.

In the case of motors, this heat is dissipated to the fork end or rear of the bicycle frame via a large contact surface on the motor interior (stator support). Cooling fins inside and outside the drive casing ensure maximum heat exchange with the surrounding area. Any heat that cannot be dissipated causes the drive motor to heat up.

The wheel hub motor monitors both the supplied energy and the temperatures reached in the motor. This prevents damage due to overheating caused by an overload situation. However, this causes a reduction in the motor power that the rider can use so that overheating can be prevented.

The higher the temperature rise in the engine, the less driving power there is that can be accessed and the less assistance there is available. If the engine cools down, the energy supply is increased again and the driving power increases. Important: the motor cannot be damaged by heating.

IMPORTANT: the motor cannot be damaged by heating. Control of the driving power in relation to the motor temperature is continuously variable to ensure assistance is always available but the motor cannot be damaged by overheating.

PRACTICAL USE: In daily use, the points listed above depend on the outside temperature, the total weight, the gradient, the ground conditions, the pedalling rate, the air pressure and the speed. These factors can lead to a temperature being reached that reduces power or assistance. However, this does not mean that the drive is faulty or is failing. The rider can continue their ride with a low level of assistance.

EXTREME EXAMPLE: A gradient of 12% over 500 metres of altitude, a total weight of 120 kg, a maximum assistance level, a driving speed of < 10 km/h and a pedalling rate of 60 rpm mean that the bike is operating under unfavourable conditions with low efficiency, a reduced range and high heat emission. This may lead to a reduction in driving power.

Recovery

The motor can recharge the battery as a generator (recovery). Electricity is generated to charge the battery. Recovery also causes a gentle braking effect. The lower the battery level is, the harder the braking effect is felt.

The two recovery levels can only be activated if the following conditions are met:

- Recovery can only be activated within a speed range between 6 and 75 km/h. Recovery cannot be activated when the vehicle is stationary or travelling at under 6 km/h.
- The battery temperature must be greater than 0 °C. Recovery is automatically deactivated under 0 °C.
- If the battery exceeds the maximum charging temperature of 50 °C, the battery's charging function is deactivated and recovery cannot be used. This function is enabled again as soon as the battery falls below this temperature limit.
- The battery charge level is less than 90%.

3.1.4.2 Rechargeable battery

The battery has an internal electronic protection circuit, which is specifically designed for the charger and the S pedelec. The battery temperature is monitored at all times. Each individual cell in a battery is protected by a steel cup and cased in a plastic housing. You must not open this housing. You must also avoid mechanical loads or exposure to intense heat since they may damage the battery cells and cause flammable contents to leak out.

The battery is protected against deep discharge, overcharging, overheating and short circuit. In the event of a hazard, a protective circuit switches the battery off automatically.

The battery has a high energy content when charged. The substances in lithium-ion battery cells may become inflammable under certain conditions. You will find codes of practice for their

safe handling in Section 2 on Safety and Section 6.9 on Rechargeable battery in the operating instructions.

If power from the electric drive system has not been used for about 10 minutes (e.g. the S pedelec is stationary) and no button has been pressed on the display or the control panel, the electric drive system and the battery are automatically switched off to save energy.

The type and duration of operating conditions have a significant effect on the battery life. Just like any other lithium-ion battery, the Bosch battery will age naturally, even if it is not being used.

Its battery life can be extended if the battery is well maintained and, more importantly, 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.

Battery performance is reduced when the temperature drops since this increases electrical resistance. As a result, you should expect the range to be shorter than normal in winter. We recommend using thermal protection sleeves when riding longer distances in the cold.

3.1.5 Riding light

When the riding light is activated, the *headlight* and the rear light are switched on together.

3.1.6 Display

The neoMMI Z20 RS features a 2-inch colour TFT display screen with 3 buttons on the touch display screen.

Figure 9: neoMMI Z20 RS display

The display screen shows all desired ride data. The operating elements control the indicators on the display screen. The display has a micro USB port beneath a rubber cover in its lower section. The S pedelec's battery powers the display when the display is inserted in the mount, a sufficiently charged battery is used on the S pedelec and the drive system is switched on.

3.2 Proper use

The S pedelec must only be used in perfect, fully functional condition. National requirements may apply to the S pedelec which the standard equipment configuration may not meet. 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* met. Approved accessories can be installed by specialist staff.

3.3 Improper use

Failure to adhere to the proper use poses a risk of personal injury and material damage. It is prohibited to use the S pedelec in the following ways:

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

3.4 Technical data

3.4.1 S pedelec

Transportation temperature	5 °C - 25 °C
Ideal transportation temperature	10 °C - 15 °C
Storage temperature	10 °C - 30 °C
Ideal storage temperature	10 °C - 15 °C
Operating temperature	5 °C - 35 °C
Work environment temperature	15 °C - 25 °C
Charging temperature	0 °C - 40 °C

Table 4: Technical data for the S pedelec

3.4.2 neodrives rear motor

Operating voltage	48 V
Power output/system	0.4 W
Shut-off speed	45 km/h
Nominal torque	12 Nm
Peak torque	40 Nm
Efficiency	85% (including electronics)
Power electronics controller	Integrated into the wheel hub
Weight	4.2 kg

Table 5: Motor technical data

3.4.3 Battery UR-V8 UR-V8 13S4P

Operating temperature	-10 °C - + 60 °C
Protection class	IPX7
Nominal capacity	13.8 Ah
Energy	625 Wh
Max. discharging current, continuous	25 A
Max. charging current, continuous	5 A
Voltage	54.6 V
Max. charge voltage	42 V
Weight	4.2 kg
Dimensions in mm (W x H x L)	130 × 60 × 450

Table 6: Technical data for UR-V8 13S4P

3.4.4 neoMMI Z20 RS display

Display control	Colour
Display diagonal size	2 inches, 240 x 320 pixels
Dimensions in mm (W x H x L)	48 × 64 × 19
Internal memory	4 GB
Ports	Connection to PC with diagnostics software
Mechanical/electrical contact	Bayonet lock (twist lock); corrosion-proof contacts, spring-loaded
Display type	TFT
Display pane	Hardened, non-reflecting Dragontail glass
Watertightness	IP67
Weight	54 g

Table 7: Display technical data

3.4.5 neoREMOTE Z20 RS and neoTWISTLOCK Z20 RS

Remote	5 buttons: Power, light, set, support level + and -; 22.2 mm inside diameter, permanently wired
Twistlock	Handlebar attachment, angle adjustable in 15° increments
Weight	55 g

Table 8: Operating element technical data

3.4.6 Brake

3.4.6.1 Magura disc brake MT5e

Brake calliper	4-piston*
Brake linings per brake calliper	4 2 x double lining
Brake fluid	MAGURA Royal Blood (mineral oil)
Grip Ø brake handle See Figure 3.4.6.1, no. 1	22 mm +0.3 mm/ - 0.1 mm
Distance from base (PM) See Figure 3.4.6.1, no. 2	74 mm ± 0.1 mm

Table 9: Technical data for Magura disc brake MT5e

Brake calliper	4-piston*
Brake disc	Magura, Type 9.S and 9.C Performance
Brake disc thickness min.-max	1.8–2.0 mm
Ø brake cable	5 mm

3.4.7 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 10: Emissions from the S pedelec*

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

3.4.8 Tightening torque

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

Table 11: Tightening torque values

*if there is no other data on the component

3.5 Environmental requirements

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

Optimal operating temperature	22 °C - 26 °C

During winter use, especially at temperatures below 0 °C, we recommend that you do not insert a battery charged and stored at room temperature into the S pedelec until just before setting off. We recommend using thermal protection sleeves when riding longer distances in the cold.

Temperatures under -10 °C and over +60 °C must be avoided.

You must also keep within the following temperature ranges:

Transportation temperature	-10 °C - 60 °C
Storage temperature	-10 °C - 50 °C
Work environment temperature	15 °C - 25 °C
Charging temperature	0 °C - 50 °C

Table 12: Technical data for the S pedelec

The S pedelec is only suitable for use on tarmacked roads. Never drive off-road or perform jumps.

3.6 Description of controls and screens

3.6.1 Handlebars

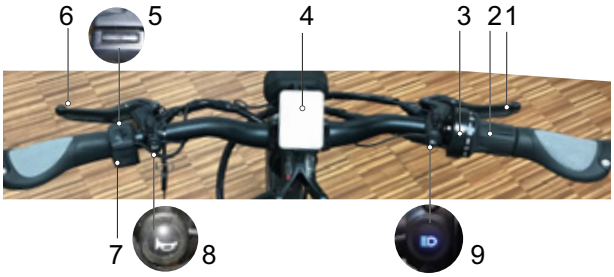


Figure 10: Detailed view of handlebars from rider position

1 Gear shift
2 Front brake lever
3 Gear indicator
4 Display
5 On-Off Button (control panel)
6 Rear brake lever
7 Control panel
8 Horn actuating switch
9 Main beam actuating switch

3.6.2 Battery indicators

The battery level indicator is on the battery:

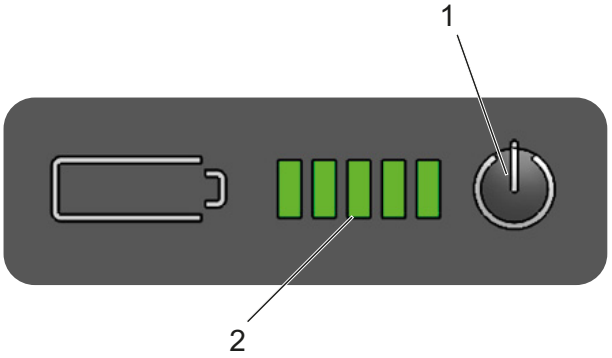


Figure 11: Overview of battery indicators

1 On-Off button
2 Battery level indicator

Symbol	Meaning
●	LED on
○	LED off
✸	LED flashing

Table 13: Battery level indicator

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

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

Table 14: Battery level indicator

3.6.3 Control panel

The drive system is operated on the control panel. The control panel features a rocker switch and three buttons.

Figure 12: Control panel overview

	Designation	Function
1	MINUS BUTTON	• Switching down the level of assistance • Activating recovery
2	PLUS BUTTON	• Switching up the level of assistance Pressing the button • Activating the push assist system (4 km/h) Holding the button down for 3 seconds
3	ON-OFF BUTTON	Switching the system on or off
4	LIGHT BUTTON	Deactivates as permanent light
5	SET BUTTON	

Table 15: Overview of the control panel

3.6.4 Display

The display has 3 buttons.

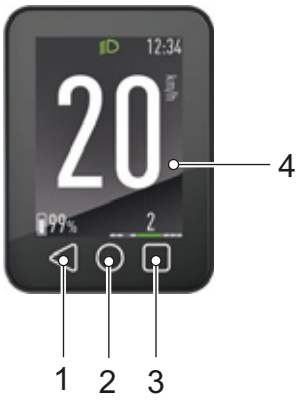


Figure 13: neoMMI Z20 RS display

1	Back button; returns to the previous selection in the active menu or switches between the display modes
2	Home button; opens the main screen directly
3	Menu button; opens and closes menus
4	On-screen indicator

3.6.5 On-screen indicators

The display screen has 4 display types:

- The main screen
- The trip screen
- The power screen
- The menu

3.6.5.1 Main screen

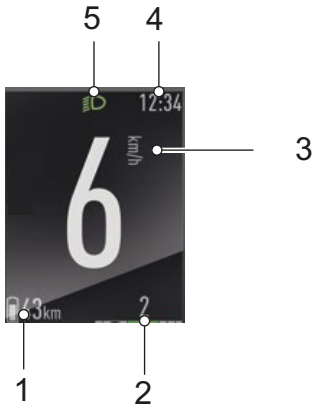


Figure 14: Main screen

1	Range indicator
2	Level of assistance indicator
3	Speed indicator
4	Clock indicator
5	Lighting indicator

Range indicator

Indicator showing the remaining range available without needing to recharge the battery. The indicator varies depending on the selected level of assistance. Example: the range is lower in Level 5 than in Level 1. The displayed value may deviate from the actual range.

Level of assistance indicator

The level of assistance indicator displays the level of assistance selected with the operating element.

Level of assistance	Use
5	The motor assistance is operating at a very high level. Power consumption is also very high.
4	The motor assistance is operating at a high output level. Power consumption is also very high.
3	The motor assistance is operating at a medium level. Power consumption is also moderate.
2	The motor assistance is operating at a low output level. Power consumption is also low.
1	The motor assistance is operating at a very low output level. Power consumption is also very low.
0 (OFF)	No motor assistance.
RECOVERY LEVEL 1	No motor assistance, energy recovery
RECOVERY LEVEL 2	No motor assistance, energy recovery

Speed indicator

The speed is displayed in the selected unit – either in km/h or mph.

Clock indicator

The current time is displayed for the selected time zone.

Lighting indicator

The riding light symbol is always displayed when the vehicle is switched on.

3.6.5.2 Trip screen

Figure 15: Trip screen

1 Trip time indicator
2 Trip distance indicator

Trip time indicator

The trip time indicator displays the trip time since it was last reset.

Trip distance indicator

The trip distance indicator displays the trip distance since it was last reset.

3.6.5.3 Power screen

Figure 16: Power screen

1 Pedalling frequency indicator
2 Rider-motor output ratio indicator
3 Calories burned indicator

Pedalling frequency indicator

The pedalling frequency indicator shows the current speed at which the rider is pedalling.

Ratio indicator

The ratio indicator displays how strong the motor power and the rider power are in relation to each other in graph form.

Calories burned indicator

The calories burned indicator shows the amount of energy in calories that the rider has consumed since the last time it was reset.

3.6.5.4 Menu screen

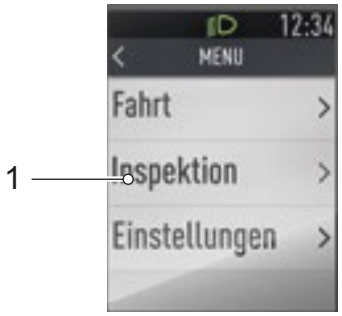


Figure 17: Menu (1)

You can use the menu to reset journey information, schedule inspections and set the system's main settings. You cannot open and adjust <Settings> while riding.

All system and service-relevant values can be read and changed in the settings. The settings menu structure is customised and may change when components or services are added.

Menu	Submenu
<TRIP>	→ <RESET TRIP>
<INSPECTION>	
<SETTINGS>	→ <TOUCHSCREEN>
	→ <BATTERY>
	→ <UNITS>
	→ <LANGUAGE>
	→ <TIME>
	→ <DATE>

<TRIP>

The TRIP menu option can be used to reset the trip time indicator, the trip distance indicator and the calories burned indicator to zero.

<INSPECTION>

The INSPECTION menu option displays

- the frame number,
- the date of the next inspection,
- how often the battery has been recharged,
- The total distance that the S pedelec motor has travelled to date (cannot be reset to zero) and
- the software versions for the individual components and their IDs.

<SETTINGS>

You can use the **<TOUCHSCREEN>** sub-menu to configure whether the display can be controlled using a finger or is blocked while riding. Blocking can be useful to prevent making operating errors while riding.

You can use the **<BATTERY>** sub-menu to determine whether the battery charge capacity should be displayed as a symbol, percentage or range.

You can use the **<UNITS>** sub-menu to choose whether the display screen shows a 24-hour clock and lengths in metres or a 12-hour clock and lengths in miles.

You can use the **<LANGUAGE>** sub-menu to select the language for the display. The following six languages can be selected:

- English
- Deutsch
- Français
- Español
- Italiano and
- Nederlands

You can use the **<TIME>** sub-menu to set the clock.

You can use the **< DATE>** sub-menu to set the date.

4 Transporting and storing

4.1 Transportation

CAUTION

Crash caused by unintentional activation

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

▶ Remove the battery.

Notice

▶ If the S pedelec is being shipped anywhere, it is recommended that the specialist dealer be entrusted with packaging it correctly.

▶ Take the weight of the ready-to-use S pedelec into account when transporting.

▶ Protect the electrical components and connections on the e-scooter from the elements with suitable protective covers.

▶ Transport the S pedelec in a dry, clean position where it is protected from direct sunlight.

4.2 Storing

▶ Store the S pedelec and its charger in a clean, dry place where it is protected from direct sunlight. Do not store outdoors to ensure a long service life.

Optimum storage temperature for the S pedelec	20 °C

Table 16: Storage temperature for batteries and the S pedelec

✓ Temperatures under -10 °C or over +50 °C must generally be avoided. Storage at about 20 °C is beneficial to a long service life.

4.2.1 Break in operation

Notice

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

▶ The battery must be recharged every 6 months.

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

▶ Never connect the battery to the charger permanently.

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

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

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

4.2.1.1 Preparing a break in operation

✓ Remove battery from the S pedelec.

✓ Charge battery to around 30%–60%.

✓ Clean the S pedelec with a damp cloth and apply wax spray to provide protection. 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.

4.2.1.2 Taking out of operation

1 Store the S pedelec, battery and charger in a dry, clean environment. The battery level should be 50–80%. We recommend storing them in uninhabited rooms with smoke alarms. Dry locations with an ambient temperature between 18 and 23 °C are ideal.

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

3 Check the battery level after 3 months. Recharge the battery to 80%.

5 Assembly

WARNING

Injury to the eyes

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

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

CAUTION

Crushing caused by unintentional activation

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

▶ Remove the battery if it is not needed for assembly.

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

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

✓ The fitting stand used must be approved for a maximum weight of at least 30 kg.

5.1 Required tools

The following tools are required to assemble the S pedelec:

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

5.2 Unpacking

CAUTION

Hand injuries caused by cardboard packaging

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

▶ Wear suitable hand protection.

▶ Remove the metal staples with pliers before the shipping carton is opened.

The packaging material consists mainly of cardboard and plastic film.

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

5.2.1 Scope of delivery

S pedelec are fully assembled in the factory for test purposes and then dismantled for transportation.

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

- the pre-assembled the S pedelec
- the front wheel
- the pedals and
- the charger
- the *operating instructions*.

The battery is supplied separately from the S pedelec.

5.3 Commissioning

CAUTION

Burns from hot drive

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

▶ Leave the drive unit to cool before assembly.

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

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

▶ For this reason, every S pedelec must be prepared, so it is fully ready for use immediately after being assembled.

▶ The assembly report (see Section 11.2) describes all safety-relevant inspections, tests and maintenance tasks for the S pedelec in a separate list. All assembly work must be completed to ensure the S pedelec is ready to ride.

▶ Complete an assembly report for quality assurance purposes.

5.3.1 Checking the battery

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

1 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 may be fully charged if at least one, but not all, of the LEDs on the battery level indicator is lit up.

2 Insert charged battery into the S pedelec.

5.3.2 Installing the wheel in the Suntour fork

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.

▶ 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 result in unfavourable 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.

1 Before installing, ensure that the quick release flange is extended. Open the lever fully.

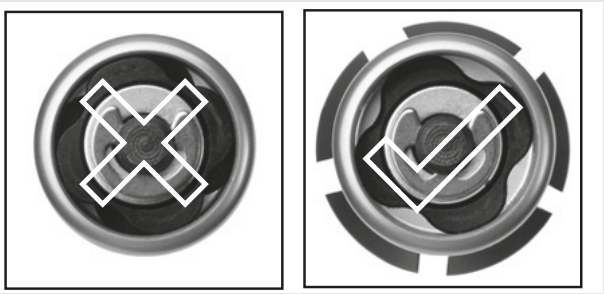


Figure 18: Closed and opened flange

2 Push in the quick release until you can hear a click. Make sure that the flange is extended.

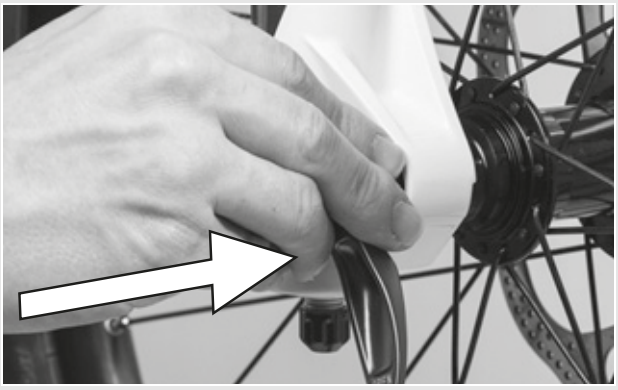


Figure 19: Pushing the quick release in

3 Adjust tensioning with half-open clamping lever until the flange reaches the fork end.

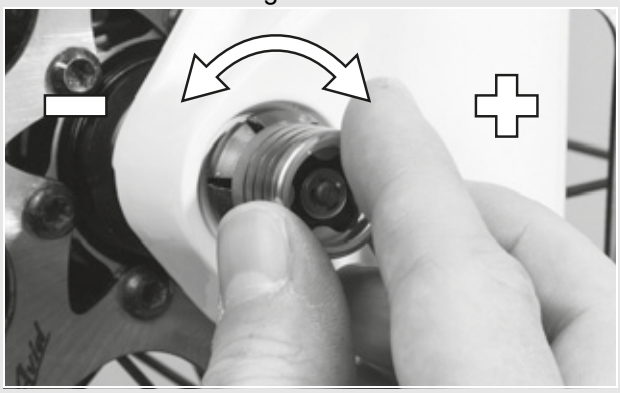


Figure 20: Adjusting the clamping

4 Fully close the quick release. Check that the quick release is firmly in place and adjust it on the flange if necessary.

⇨ The lever is secured.

Figure 21: Closing the quick release

5.3.3 Checking the stem and handlebars

5.3.3.1 Checking the connections

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

2 Try to twist the handlebars towards the front wheel.

⇨ The stem must not move or twist.

5.3.3.2 Firm hold

1 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.

2 If the handlebars shaft should move in the fork steerer, increase the quick release lever tensioning. To do so, turn the knurled nut slightly clockwise with the quick release lever open.

3 Close the lever and check the stem is firmly in position.

5.3.3.3 Checking the headset backlash

1 To check the handlebar headset backlash, close the quick release lever on the stem.

2 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 S pedelec backwards and forwards.

3 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.

4 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.

5.4 Bleeding the brake

1 Check brake system through sight glass.

2 Bleed brake if necessary.

5.5 Selling the S pedelec

▶ Hand the CoC papers over to the buyer.

▶ Note down the battery key manufacturer and its number.

▶ Adjust the S pedelec to the rider; see Section 6.6.

▶ Adjust the *stand* and *shifter*.

▶ Instruct the operator or rider on how to use all the S pedelec's functions.

6 Operation

6.1 Risks and hazards

⚠WARNING

Injuries and death caused by other road users

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

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

Injuries and death caused by riding incorrectly

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

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

Injuries and death 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 display or your mobile phone.
- ▶ Stop S pedelec if you want to make inputs on the display other than a change in level of assistance. Only enter data when the S pedelec is stationary.

⚠CAUTION

Crash caused by loose clothing

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

- ▶ Wear sturdy footwear and close-fitting clothing.

Crash caused by difficult-to-spot damage

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

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

Crash caused by material fatigue

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

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

⚠ CAUTION

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.

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 when it is raining.

Crash caused by soiling

Thick dirt can impair S pedelec functions, such as braking. This may cause a crash with injuries.

- ▶ Remove coarse soiling before riding.

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

When riding downhill, high speeds may be reached. The S pedelec is only designed to exceed a speed of 25 km/h for short intervals. The *tyres* in particular can fail if exposed to a continuous load.

- ▶ Use the brakes to decelerate the S pedelec if you reach speeds greater than 25 km/h.

Notice

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

- ▶ Keep the S pedelec dry and free from frost at all times.
- ▶ If the S pedelec is to be used at temperatures below 3 °C, the specialist dealer must carry out an inspection and prepare it for winter use.

Off-road riding subjects the joints in the arms to severe strain. Take a break from riding every 30 to 90 minutes, depending on the road surface conditions and your physical fitness

6.2 Personal protective equipment

It is recommended that you wear a suitable cycling helmet, sturdy footwear and typical, close-fitting, reflective sports clothing.

6.3 Tips for a greater range

The S pedelec's range depends on many influencing factors. A single battery charge may only last fewer than 20 kilometres but much more than 100 is also possible. There are a few tips which will generally help you maximize range.

Switching on recovery

▶ Always switch on recovery when riding downhill.

Suspension elements

▶ Only open suspension fork and damper when necessary on terrain or gravel paths. Block suspension fork and damper on tarmacked roads or on hills.

Pedalling frequency

▶ Ride using pedalling frequencies of over 50 revolutions per minute. This optimises the electric drive's efficiency.

▶ Avoid pedalling very slowly.

Weight

▶ Minimise the total weight of the S pedelec and baggage.

Stopping and starting

▶ Ride long distances at a constant speed.

▶ Avoid stopping and starting frequently.

Gear shift

▶ Use a low gear and a low level of assistance on hills and when setting off.

▶ Switch up a gear depending on the speed and terrain.

Tyre pressure

▶ Always use the maximum permitted tyre pressure.

Battery and temperature

Electrical resistance increases as the temperature drops. Battery performance is reduced. As a result, you should expect the range to be shorter than normal in winter.

▶ Use a thermal protection sleeve on the battery in winter.

6.4 Error messages

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

Code	Remedy
The system won't switch on (nothing on the display screen)	▶ Remove the battery from its holder and reinsert it and plug in the connector again if necessary. ▶ Check the connector, contacts and contact surfaces on the display and battery for any dirt. Metal particles may accumulate, particularly if the connector is magnetic. Such particles can be difficult to remove. ▶ Press the battery button, so that the LEDs light up.
The battery cannot be charged	▶ Carefully check the charger connector and the battery socket for any deposits. Metal particles quickly accumulate if the connector or socket is magnetic. ▶ The battery cannot be charged if the ambient temperature is <0 °C. Always charge the battery at room temperature. ▶ Observe the information on charging in the charger operating instructions, particularly the error codes.
No motor assistance (display in operation, motor assistance not available)	▶ Remove the battery from its holder and reinsert it. Plug the connector in again if necessary. ▶ Fully charge the battery once. ▶ Turn the display downward from its holder dock, wait about a minute and turn it back up again. ▶ Check that all connectors are in the right position and check all cables for any breakage – due to sharp kinking, for example. ▶ If the ambient temperature is <0 °C, the battery cannot be charged, meaning recovery cannot be used either.
Recovery does not work	▶ Is the battery charge level > 90%? Recovery will only work if the charge level is ≤ 90%. ▶ Is the current riding speed less than 10 km/h? Recovery is not possible below 10 km/h. ▶ Is the current riding speed more than 40 km/h? Recovery performance is reduced above 40 km/h. ▶ Is the ambient temperature <0 °C? The battery cannot be charged and cannot be restored either at a cell temperature below 0 °C.
The motor does not deliver full power	▶ The motor may have reached a high temperature range. Power is gradually reduced when the temperature in the electronics is 80 °C or higher. Leave the S pedelec to cool in the shade for about 10 minutes and then resume your ride. ▶ As the battery voltage decreases, the power and top speed also decrease slightly. When the battery is almost empty, the maximum speed can be 2-3 km/h below the level achieved when riding with a fully charged battery.
Range seems too short	▶ The range depends on »»Ride profile »»Assistance mode »»Tyre pressure »»Riding performance »»Training status »»Total weight »»Outside temperatures »»Battery capacity »»The selected trip distance »»Charging smartphones via the display ▶ If just one of these factors is not optimal, the range can already be significantly reduced. Example: If the outside temperature is 0 °C, the range may be 30-40% less.

Table 17: List of system messages

Table 17: List of system messages

6.4.1 Battery error message

The battery is protected against deep discharge, overcharging, overheating and short circuits by Electronic Cell Protection (ECP). In the event of a hazard, a protective circuit switches the battery off automatically.

If a battery defect is detected, two LEDs flash on the battery level indicator. Contact an authorised specialist dealer if this happens.

Code	Description	Method of resolution
		
	If the battery is outside its charging temperature range, three LEDs will flash on the battery level indicator.	▶ Disconnect the battery from its charger until it comes within the charging temperature range. Do not connect the battery to the charger again until the permitted charging temperature has been reached.
		
	If a fault is detected in the battery, two LEDs flash on the battery level indicator.	▶ Contact your specialist dealer.
		
	No LEDs will flash if the charger is defective. One or more LEDs will light up permanently, depending on the battery level.	▶ Contact your specialist dealer.
		
	No LEDs will light up if there is no power.	▶ Check all plug connections. ▶ Check the contacts on the battery for dirt. Clean the contacts carefully if they need cleaning. ▶ Contact your specialist dealer if the problem persists.

6.5 Instruction and customer service

Your supplying specialist dealer will provide customer service. Contact details can be found on the S pedelec pass for these operating instructions. The specialist dealer will explain all the S pedelec functions to you in person, this being when the specialist dealer hands over the S pedelec at the latest. These operating instructions are provided to you with every S pedelec, so that you can consult them at a later stage.

Your specialist dealer will also be happy to assist you in the future whether you require maintenance, conversion or repair.

6.6 Adjusting the S pedelec

⚠ CAUTION

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 S pedelec will guarantee 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.

6.6.1 Adjusting the saddle

6.6.1.1 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 S pedelec to your needs for initial use.

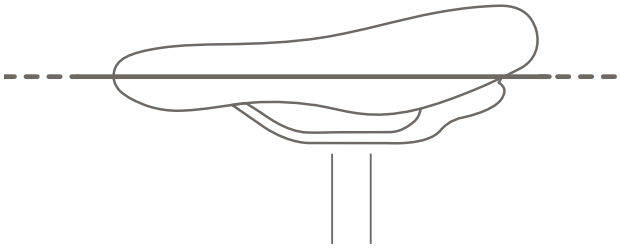


Figure 22: Horizontal saddle tilt

6.6.1.2 Determining the seat height

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

1 Climb onto the S pedelec.

2 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.

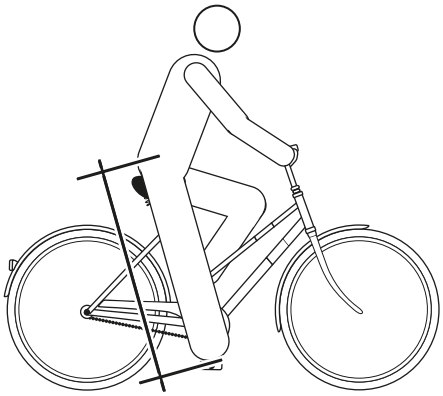


Figure 23: Optimal saddle height

6.6.1.3 Adjusting the seat height with quick release

1 Open the quick release on the seat post to change the seat height (1). To do so, push the clamping lever away from the seat post (3).

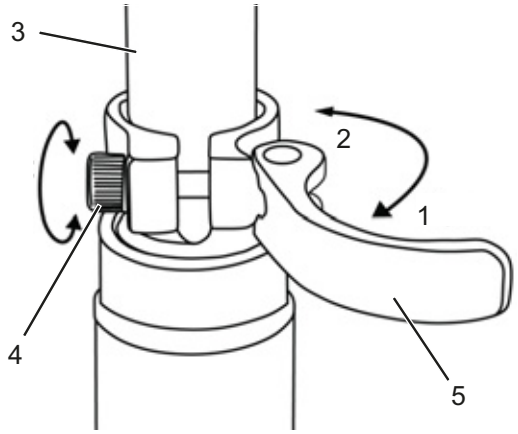


Figure 24: Opening the seat post quick release

2 Set the seat post at the required height.

CAUTION

Crash caused by an excessively high seat post setting

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

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

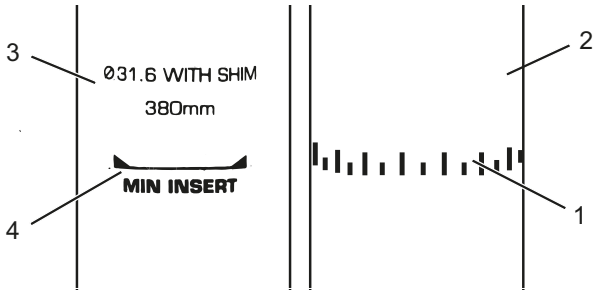


Figure 25: Detailed view of the seat post – examples of the minimum insertion depth marking

3 To close it, push the *seat post clamping lever* as far as it will go into the *seat post* (2).

4 Check the *clamping force of quick releases*.

6.6.1.4 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 need to adjust the saddle height again since both settings affect one another.

✓ To adjust the seat position safely, either push the S pedelec near to a wall, so that you can lean on the wall to support yourself or ask another person to hold the S pedelec for you.

1 Climb onto the S pedelec.

2 Place the pedals into the vertical position with your feet.

The rider is sitting in the optimal sitting position if the perpendicular line from the kneecap runs through the pedal axle.

3.1 If the perpendicular line crosses behind the pedal, bring the saddle forward.

3.2 If the perpendicular line crosses in front of the pedal, bring the saddle back.

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

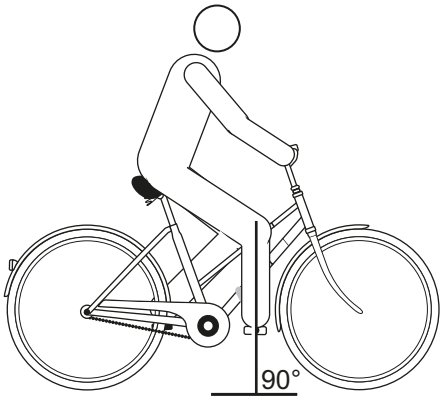


Figure 26: Knee cap perpendicular line

✓ The handlebar settings must only be adjusted while the S pedelec is stationary.

▶ Unfasten and adjust the designated screw connections, and clamp them with the maximum tightening torque for the clamping screws of the handlebars.

6.6.2 Adjusting 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 result in unfavourable 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.

6.6.3 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.

6.6.3.1 Adjusting the height of the handlebars

1 Open the **stem clamping lever**.

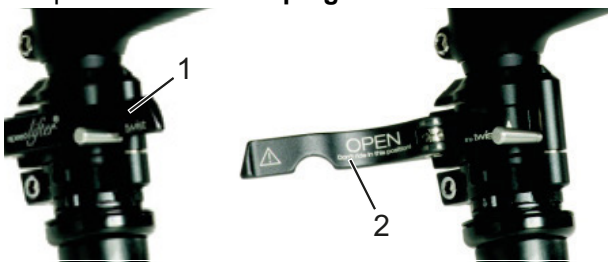


Figure 27: Open (2) and closed (1) stem clamping lever – by.schulz speedlifter used as an example

2 Pull the **stem clamping lever** upwards while swivelling the handlebars into the required position.

⇨ You feel the locking lever click into place.

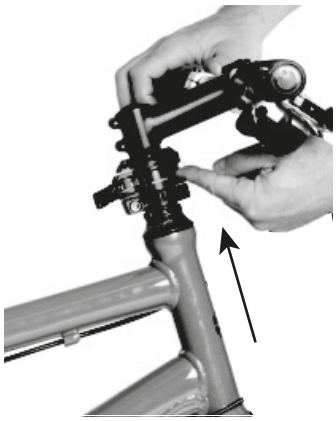


Figure 28: Pulling locking lever upwards – by.schulz speedlifter used as an example

3 Pull out the handlebars to the required height.

4 Close the **stem clamping lever**.

6.6.3.2 Adjusting the quick release clamping force

- ▶ If the *handlebar clamping lever* stops before reaching its end position, unscrew the *knurled nut*.
- ▶ Tighten the *knurled nut* on the seat post if the *seat post clamping lever's* clamping force is not effective enough.
- ▶ If you are unable to set the clamping force, the specialist dealer will need to check the quick release.

6.6.4 Retracting the brake linings

Disc brakes require wearing-in time. The braking force increases over time. You therefore need to be aware that the braking force may increase during the wearing-in period. The same happens after brake pads or discs are replaced.

1 Accelerate S pedelec to about 25 km/h.

2 Brake S pedelec until it comes to a halt.

3 Repeat process 30–50 times.

⇨ The disc brake is retracted and provides optimal braking power.

6.6.5 Adjusting the Suntour fork

CAUTION

Crash caused by incorrectly set suspension

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

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

Notice

Settings on the chassis change riding performance significantly. You need to get used to the S 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.

6.6.5.1 Adjusting the negative deflection

Negative deflection depends on the rider's weight and sitting position. The recommended negative deflection is between 15% (hard) and 30% (soft) of the *total fork deflection*.

6.6.5.2 Adjusting the steel suspension fork negative deflection

Only applies to S pedelecs with this equipment

You can adjust the tensioning in the fork spring to the rider's weight and their preferred riding style. This reduces the negative deflection in the fork.

Figure 29: Negative deflection setting wheel on the suspension fork crown

1 You will find the **negative deflection setting wheel** beneath the plastic cover on the **crown**. Remove the plastic cover.
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 decrease the spring pre-tensioning.

⇨ You will have made the ideal setting if the shock absorber deflects 3 mm when bearing the rider's weight.

3 Replace the plastic cover on the **crown** after making the setting.

6.6.5.3 Adjusting the air suspension fork negative deflection

Only applies to S pedelecs with this equipment

- ▶ The **air valve** is located beneath the **valve cap** on the **crown** of the left-hand shock absorber. Unscrew the **valve cap**.

Figure 30: Screw caps in different designs

1 Attach a high-pressure damper pump to the **air valve**.

2 Pump air suspension fork to the required pressure. Observe the levels in the **Suntour filling pressure table**. Never exceed the recommended **maximum air pressure**.

Rider weight	Mobie 45 air
< 55 kg	35 - 50 psi
55 - 65 kg	50 - 60 psi
65 - 75 g	60 - 70 psi
75 - 85 kg	70 - 85 psi
85 - 95 kg	85 - 100 psi
< 95 kg	+ 105 psi
Pressure on delivery	90 psi
Maximum air pressure	**120 psi**

Table 18: Suntour filling pressure table for air forks

3 Detach high-pressure damper pump.

4 Measure the distance between the **crown** and the **dust seal**. This distance is *total deflection* of the fork.

5 Push a temporarily attached cable tie downward against the **dust seal**.

6 Put on your normal cycling clothing, including luggage.

7 Sit on the S pedelec in your usual riding position and support yourself against an object, such as a wall or tree.

8 Get off the S pedelec without allowing it to deflect.

9 Measure distance between the **dust seal** and the cable tie.

⇨ This measurement is the negative deflection. The recommended value is between 15% (hard) and 30% (soft) of the total fork deflection.

10 Increase or reduce air pressure until you have reached the desired negative deflection.

⇨ If the negative deflection is correct, turn the **valve cap** in a clockwise direction.

⇨ If you are unable to achieve the desired negative deflection, an internal adjustment may be needed. Contact your specialist dealer.

6.6.5.4 Adjusting the air suspension fork rebound

The *rebound* setting depends on the *negative deflection* setting: A higher negative deflection requires a lower rebound setting.

1 Turn the **Suntour rebound screw** in a clockwise direction to the closed position until it stops.

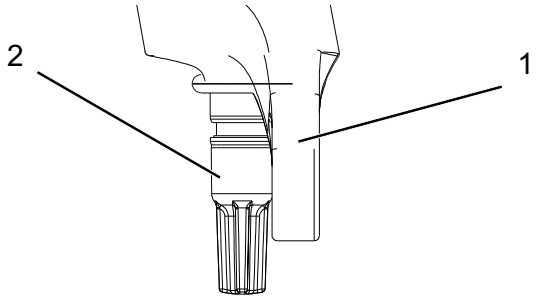


Figure 31: Suntour rebound screw (2), fork (1)

2 Turn the **Suntour rebound screw** slightly in an anti-clockwise direction.

3 Adjust the rebound in such a way that the fork rebounds quickly, but without bottoming out upward. Bottoming out refers to when the fork rebounds too quickly and stops moving abruptly once it has reached the full rebound distance. You can hear and feel a slight impact when this happens.

6.7 Accessories

Basic rules for attaching accessories

	Child seats	We strongly advise against fitting a child seat for safety reasons
	Trailer	Not permitted
	Additional battery Headlight	Not permitted
	Use of baskets	Not advisable
☐	Non-permanently attached bags on the pannier rack	Permitted
☐	Top cases on the pannier rack	Permitted

The following accessories are recommended:

Description	*Article number*
Protective cover for electrical components	080-41000 ff
Panniers, system component*	080-40946
Bicycle box	080-40947

Table 19: Accessories

6.8 Before each ride

⚠ CAUTION

Crash caused by difficult-to-spot damage

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

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

Crash caused by material fatigue

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

▶ Remove the S pedelec from service immediately if there are any signs of material fatigue. Have the specialist dealer check the state.

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

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

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

6.9 Check list before each ride

▶ Check the S pedelec before each ride.

⇨ Take the S pedelec out of service if you spot any anomalies.

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

6.10 Using the kickstand

CAUTION

Crash caused by a lowered kickstand

There is a risk of crashing if riding with the kickstand lowered.

- ▶ Raise the kickstand completely before setting off.

Notice

The S pedelec's force of weight may cause the kickstand to sink into soft ground, possibly causing the S pedelec to topple over as a result.

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

6.10.1 Raising the kickstand

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

6.10.1.1 Parking the S pedelec

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

6.11 Using the pannier rack

CAUTION

Crash caused by loaded pannier rack

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

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

CAUTION

Crash caused by unsecured baggage

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

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

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

Crushing the fingers in the spring flap

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

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

Notice

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

- ▶ Never exceed the maximum permitted *total weight* when packing the pannier.
- ▶ Never exceed the maximum load bearing capacity of the pannier rack.
- ▶ Never modify the *pannier rack*.

- ▶ Distribute the baggage as evenly as possible between the left- and right-hand side.
- ▶ We recommend the use of panniers and baggage baskets.

6.12 Rechargeable battery

Notice

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

▶ Remove the key from the battery lock immediately after use.

▶ We recommend that you attach the key to a key ring.

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

6.12.1 Removing the battery

1 Use your right hand to push the battery up into the frame.

⇨ The lock hook is disengaged in the frame.

2 Turn the key anti-clockwise until it stops to unlock the battery.

3 Press the lock mechanism.

4 Remove the battery from the down tube.

5 Turn the key back to its original position.

6 Remove the key. If the key remains in the lock, there is a risk of it breaking – when the crank turns, for example.

6.12.2 Inserting the battery

1 Insert the battery into the frame from the top.

2 Swivel the battery into the down tube. Apply a little pressure to push the battery into the frame until you hear and feel it click into place.

3 Check the battery is firmly in position.

6.12.3 Charging the battery

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.

▶ Contact your specialist dealer if you are unable to recharge the battery or it is damaged.

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

1 Remove the rubber cover from the battery.

2 Connect mains cable to the charger and plug into a socket.

3 Connect the charger plug to the battery charging socket.

4 Set the toggle switch on the charger to "On".

5 The green LED on the charger will flash quickly at a steady rate for about 5–10 seconds. If the display is connected to the S pedelec, it will switch on for a few seconds before it switches off automatically again.

6 After about 5 seconds, the LEDs on the battery will light up in the following pattern:

- All 5 LEDs flash in sequence:

⇨ Battery is charging. The charge level is between 0 and 20%.

- 1 LED lights up continuously; LEDs 2–5 flash in sequence:

⇨ Battery is charging. The charge level is between 20 and 40%.

- 2 LEDs light up continuously; LEDs 3–5 flash in sequence:

⇨ Battery is charging. The charge level is between 40 and 60%.

- 3 LEDs light up continuously; LEDs 4–5 flash in sequence:

⇨ Battery is charging. The charge level is between 60 and 80%.

- 4 LEDs light up continuously; LED 5 flashes:

⇨ Battery is charging. The charge level is between 80 and 100%.

Indicators on the charger

There are different indicators on the charger

- Green LED flashes about once a second:
⇨ Charging.
- Green LED lights up continuously:
⇨ Battery fully charged; charging complete
- Green LED flashes briefly every 2 seconds:
⇨ No battery is connected; battery is not being charged
- Red LED flashes: Charging error.
⇨ If there is a charging error, first check that connectors are positioned correctly, there is no dirt and no cables are buckled. If the charger has a magnetic connector, check the magnetic connector on the charger and the magnetic socket on the battery for dirt from time to time or there is a problem during charging. Metal chips and small parts such as washers accumulate there quickly due to the magnet.

Charging time

A full charge (0%–100%) takes almost 4 hours. The charger supplies an average charging current of 4 A. This means that it charges at an average of 4 A over a full charge cycle (fully discharged battery to fully charged battery). The charging process is complete when the battery level indicator LEDs go out.

7 If the battery is fully charged, the charger switches off.

⇨ The green LED on the charger lights up continuously and the LEDs on the battery go out.

⇨ The battery is automatically placed in sleep mode after the charger plug is disconnected.

6.12.4 Querying current charge level

▶ Press battery button briefly.

- 5 lit LEDs:
⇨ The battery is charged between 80 and 100%.
- 4 lit LEDs:
⇨ The battery is charged between 60 and 80%.
- 3 lit LEDs:
⇨ The battery charge level is between 40 and 60%.
- 2 lit LEDs:
⇨ The battery is charged between 20 and 40%.
- 1 lit LED:
⇨ The battery is charged between 0 and 20%.
- 1 flashing LED:
⇨ The battery is flat.

6.13 Electric drive system

6.13.1 Switching on the electric drive system

CAUTION

Crash caused by lack of readiness for braking

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

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

✓ A sufficiently charged battery has been inserted into the S pedelec.

✓ The battery is firmly positioned. The key has been removed.

▶ Press on the **On-Off button (battery)** to wake the battery up from sleep mode.

▶ Press the **On-Off button (control panel)** for about one second.

⇨ The initialisation process is completed after about five seconds and the display shows the trip screen.

⇨ The S pedelec is ready for use.

6.13.2 Switching off the electric drive system

Notice

▶ The battery is automatically placed in sleep mode if it is not used (display switched off, the battery button not pressed). When the battery is in this state, the standby power consumption is reduced to a minimum, thus allowing longer storage periods without major loss of capacity, for example.

Press the **On-Off button (control panel)** on the control panel for about 1 second.

⇨ The display and drive system are switched off.

⇨ You will not cause any damage if the screen is removed without switching off the system.

6.13.3 Placing the battery in sleep mode

1 Press the **On-Off button (battery)** down for more than 5 seconds.

⇨ The LEDs will go off one by one.

2 When the last LED has gone out, press the **On-Off button (battery)** for about 2–3 seconds more.

⇨ The battery will go into sleep mode in the next 60 seconds.

6.13.4 Waking the battery up from sleep mode

1 Press the **On-Off button (battery)** briefly.

⇨ All 5 LEDs will go on initially, followed by a brief pause, after which all LEDs will flash briefly three times. The battery is ready to operate again.

6.14 Display

Notice

▶ Do not use the display as a handle. The display may become irreparably damaged if you use it to lift the S pedelec.

▶ Remove the display from its mount if the S pedelec is not going to be used for several weeks. Store away safely in a dry environment at room temperature.

6.14.1 Attaching the display

1 Place the screen at a 90° angle to the mount on the handlebars.

2 Turn clockwise.

⇨ The display is fully attached when it is upright and locked into position.

6.14.2 Removing the display

✓ The system – the display and drive system – should be switched off before the display is removed. However, nothing will be damaged if you attach or detach the display while the drive system is switched on.

✓ Wait for about 30 seconds after removing the display before switching the display back on again; otherwise, successful system initialisation cannot be guaranteed.

1 Turn the display 90° anticlockwise on its mounting plate.

⇨ The electrical connections are disconnected.

2 Remove the display.

⇨ The drive system will switch off about 10 seconds after the display is detached. If the light was on, it will also switch off after about 15 seconds.

6.14.3 Using the main beam

✓ The drive system needs to be switched on first to turn on the *main beam*.

▶ Press **main beam button** briefly.

⇨ The *main beam* is switched on and the *main beam symbol* is displayed on the **main beam button**.

▶ Press **the main beam button** briefly again.

⇨ The *main beam* is switched off and the *main beam symbol* is displayed.

6.14.4 Selecting the level of assistance

▶ Press the **plus button**.

⇨ The level of assistance is increased.

▶ Press the **minus button**.

⇨ The level of assistance is reduced.

⇨ The set level of assistance is shown on the display.

6.14.5 Switching on recovery

✓ Recovery can only be activated within a speed range between 6 and 45 km/h. Recovery cannot be activated when the vehicle is stationary or travelling at under 6 km/h.

✓ The battery cell temperature must be higher than 0 °C to switch on recovery. Recovery is automatically deactivated under 0 °C.

✓ The battery charge level must be higher than 10% to switch on recovery. The lower the battery level is, the harder braking is due to recovery.

▶ Press the **minus button** repeatedly until you reach level of assistance 0.

▶ Use the **minus button** to switch down one level further from this level.

⇨ Recovery will work at a low power output at level 1.

▶ Use the **minus button** to switch down one level further.

⇨ Recovery will work at a high power output at level 2.

6.14.6 Switching off recovery

▶ Press the **Plus button** repeatedly until you reach level of assistance 0.

⇨ Recovery is now switched off.

6.14.7 Changing screens

The display screen has 4 display types:

- The main screen
- The trip screen
- The power screen
- The menu

Main screen

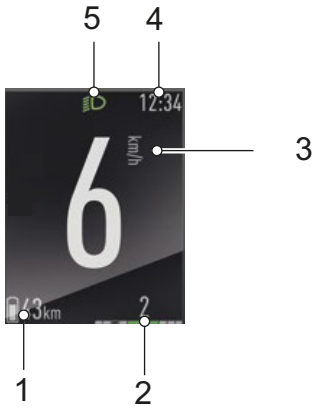


Figure 32: Main screen

1	Range indicator
2	Level of assistance indicator
3	Speed indicator
4	Clock indicator
5	Lighting indicator

Trip screen

Figure 33: Trip screen

1	Trip time indicator
2	Trip distance indicator

Power screen

Figure 34: Power screen

1	Pedalling frequency indicator
2	Rider-motor output ratio indicator
3	Calories burned indicator

6.14.7.1 Menu screen

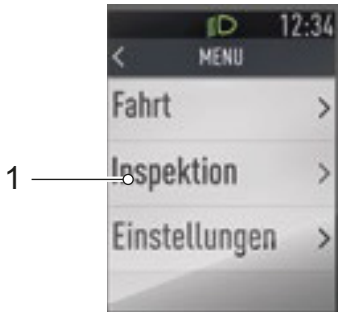


Figure 35: Menu (1)

Figure 36: neoMMI Z20 RS display

The display has 3 buttons which can be used to change screens:

Back button (triangle)

Home button (circle)

Menu button (square)

6.14.7.2 Changing screens

▶ Press the **Set button (control panel)**.

6.14.7.3 Returning to the last screen

▶ Press the **Back button**.

6.14.7.4 Opening the main screen

▶ Press the **Home button**.

6.14.7.5 Opening and closing the menu

▶ Press the **menu button**.

You can use the menu to reset journey information, schedule inspections and set the system's main settings. You cannot open and adjust <Settings> while riding.

All system and service-relevant values can be read and changed in the settings. The settings menu structure is customised and may change when components or services are added.

Menu	Submenu
<TRIP>	→ <RESET TRIP>
<INSPECTION>	
<SETTINGS>	→ <TOUCHSCREEN>
	→ <BATTERY>
	→ <UNITS>
	→ <LANGUAGE>
	→ <TIME>
	→ <DATE>

6.14.8 Re-set trip time, trip distance and calories to zero

1 Open menu.

2 Tap on **TRIP**.

3 Tap on the **<Reset>** button.

⇨ The value for the 3 indicators is reset to 0.

4 Tap on **TRIP** or the **Back button** to return to the main menu. Press on the **Home button** to open the main screen directly.

6.14.9 Changing the touchscreen settings

You can use the **<TOUCHSCREEN>** sub-menu to configure whether the display can be controlled using a finger or is blocked while riding. Blocking can be useful to prevent making operating errors while riding.

1 Open menu.

2 Tap on **SETTINGS**.

3 Tap on **TOUCHSCREEN**.

4 Tap on either **Inactive** or **Always active**.

⇨ The selected function is executed.

5 Tap on **TOUCHSCREEN** or the **Back button** to return to the main menu. Press on the **Home button** to open the main screen directly.

6.14.10 Changing the battery view

You can use the **<BATTERY>** sub-menu to determine whether the battery charge capacity should be displayed as a symbol, percentage or range.

1 Open menu.

2 Tap on **SETTINGS**.

3 Tap on **BATTERY**.

4 Tap either on **Symbol, Percentage** or **Range**.

⇨ The selected function is executed.

5 Tap on **BATTERY** or the **Back button** to return to the main menu. Press on the **Home button** to open the main screen directly.

6.14.11 Changing the units

You can use the **<UNITS>** sub-menu to choose whether the display screen shows a 24-hour clock and lengths in metres or a 12-hour clock and lengths in miles.

1 Open menu.

2 Tap on **SETTINGS**.

3 Tap on **UNITS**.

4 Tap on either **Metric (kilometres per hour [km/h] and a 24-hour clock)** or **English (miles per hour [mph] and 12-hour clock)**.

⇨ The selected function is executed.

5 Tap on **UNITS** or the **Back button** to return to the main menu. Press on the **Home button** to open the main screen directly.

6.14.12 Changing the language

You can use the **<LANGUAGE>** sub-menu to select the language for the display.

1 Open menu.

2 Tap on **SETTINGS**.

3 Tap on **LANGUAGE**.

4 Tap:

- English
- Deutsch
- Français
- Español
- Italiano or
- Nederlands

5 The selected language will be displayed.

6 Tap on **LANGUAGE** or the **Back button** to return to the main menu. Press on the **Home button** to open the main screen directly.

6.14.13 Changing the time

You can use the **<TIME>** sub-menu to set the clock.

1 Open menu.

2 Tap on **SETTINGS**.

3 Tap on **TIME AND DATE**.

4 Tap on **TIME**.

⇨ The active field is highlighted in white with a light-green edge below whereas non-active fields are shown in light grey.

⇨ The "Time" menu allows you to select hours and minutes.

5 Press the "+" or "–" field on the lower screen to set the current time.

⇨ The time entered is displayed.

6 Tap on **TIME** or the **Back button** to return to the main menu. Press on the **Home button** to open the main screen directly.

6.14.14 Changing the date

You can use the **< DATE>** sub-menu to set the date.

1 Open menu.

2 Tap on **SETTINGS**.

3 Tap on **TIME AND DATE**.

4 Tap on **DATE**.

⇨ The active field is highlighted in white with a light-green edge below whereas non-active fields are shown in light grey.

⇨ The date menu allows you to select day, month and year.

5 Press the **"+"** or **"–" field** on the lower display screen to set the current date.

⇨ The date entered is displayed.

- Tap on **DATE** or the **Back button** to return to the main menu. Press on the **Home button** to open the main screen directly.

6.15 Brake

⚠WARNING

Crash caused by brake failure

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. Any air bubbles or water contained in the brake system may expand due to heat. 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.
- ▶ Never use the S pedelec if the brakes don't work properly or you can feel no resistance when you grip the brake handle. Consult a specialist dealer.

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

Correct handling of the brake helps control the S pedelec and prevents crashes.

- ▶ In order to achieve optimum braking results, do not pedal while braking.
- ▶ Shift your body weight backwards and down as far as possible.
- ▶ Practice braking and emergency braking before using the S pedelec in public spaces.

6.15.1 Using the brake lever

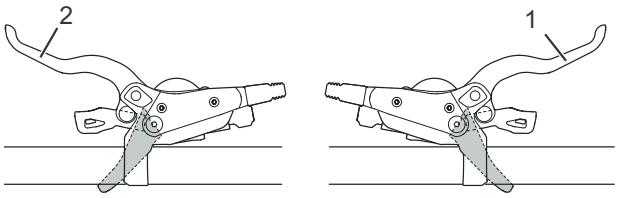


Figure 37: Front (2) and rear (1) brake lever – Shimano brake used as an example

- ▶ Push the left-hand *brake lever* to apply the *front wheel brake*.
- ▶ Push the right-hand *brake lever* to apply the *rear wheel brake*.

6.16 Suspension and damping

6.16.1 Adjusting the compression in the Suntour fork

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 38: Suntour compression adjuster with 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 positions between OPEN and LOCK provide fine adjustment of compression damping.

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

6.17 Gear shift

It is possible to switch several gears (from 06 to 02, for example) easily with the pinion gear.

Changing gear is possible when the crank is stationary or rotating backwards and is gentle on the gears.

It is possible to shift down gears without any restrictions when under load. The gear change will not be completed if there is too much pressure on the crank or on the pedal.

A mechanism in the gears allows the ride to shift up a gear under load. This is possible for all gear shifts, except a change of gear between the different half-gears. The rider needs to take the pressure off the pedals briefly in this case.

The crank falls about 10° after the gear change in isolated cases. The rider will feel a short jerk until the pawl is securely engaged in the next tooth. This phenomenon cannot always be eliminated, but will not cause damage to the gears.

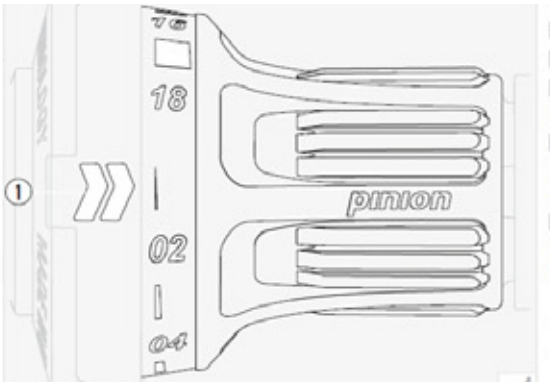


Figure 39: Pinion gear twist grip

- ▶ Always reduce the pressure on the pedals when shifting down.
- ▶ Always reduce the pressure on the pedals when shifting up from 06 to 07 or from 12 to 13.
- ▶ Always reduce the pressure on the pedals when shifting up from 03 to 04 or from 06 to 07.

7 Cleaning and servicing

Cleaning check list

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

Maintenance check list

☐	Check for tyre wear	once a week
☐	Check for rim wear	once a week
☐	Check tyre pressure	once a week
☐	Check brakes for wear	once a month
☐	Check electrical cables and Bowden cables for damage and ensure they are fully functional	once a month
☐	Check chain tension	once a month
☐	Check tension of the spokes	every three months
☐	Check the gear shift setting	every three months
☐	Check suspension fork and, if necessary, rear frame damper for wear and ensure fully functional	every three months
☐	Check for wear on brake discs	at least every six months

⚠ CAUTION

Crash and falling caused by unintentional activation

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

▶ Remove the battery before cleaning.

Servicing measures must be performed regularly. Contact your specialist dealer if you are unsure.

7.1 Cleaning after each ride

Required tools and cleaning agents:

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

7.1.1 Cleaning the suspension fork

▶ Remove dirt and deposits from the stanchions and deflector seals with a damp cloth.

▶ Check the stanchions for dents, scratches, staining or leaking oil.

▶ Check the air pressure.

▶ Lubricate the dust seals and stanchions.

7.1.2 Cleaning the rear frame damper

▶ Remove dirt and deposits from the damper body with a damp cloth.

▶ Check rear frame damper for dents, scratches, staining or leaking oil.

7.1.3 Cleaning the pedals

▶ Clean with a brush and soapy water after riding through dirt or rain.

⇨ Service the pedals after cleaning.

7.2 Basic cleaning

⚠ CAUTION

Crash caused by brake failure

The braking effect may be unusually poor temporarily after cleaning, servicing or repairs. 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 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 S pedelec with a pressure washer.

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

▶ Never apply grease or oil to clamping sections.

Required tools and cleaning agents:

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

✓ Remove battery and display before basic cleaning.

7.2.1 Cleaning the frame

1 Soak the entire frame with dish-washing detergent if the dirt is thick and ingrained.

2 After leaving it to soak for a short time, remove the dirt and mud with a sponge, brush and toothbrushes.

3 Use a watering can or your hand to rinse the frame.

4 Service the frame after cleaning.

7.2.2 Cleaning the stem

1 Clean stem with a cloth and soapy water.

2 Service the stem after cleaning.

7.2.3 Cleaning the wheel

⚠ WARNING

Crash caused by braking hard on rims

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

Check rim *wear* on a regular basis.

1 Check the tyres, rims, spokes and spoke nipples for any damage when cleaning the wheel.

2 Use a sponge and a brush to clean the hub and spokes from the inside to the outside.

3 Clean the rim with a sponge.

7.2.4 Cleaning the drive elements

1 Spray the cassette, the chain wheels and the front derailleur with a degreasing agent.

2 Clean coarse dirt with a brush after soaking for a short time.

3 Wash down all parts with dish-washing detergent and a toothbrush.

4 Service the drive elements after cleaning.

7.2.5 Cleaning the rear frame damper

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

7.2.6 Cleaning the chain

Notice

- ▶ Never use aggressive (acid-based) cleaners, rust removers or degreasers when cleaning the chain.
- ▶ Never use chain cleaning devices or chain cleaning baths.

1 Slightly dampen a brush with dish-washing liquid. Brush both sides of the chain.

2 Dampen a cloth with soapy water. Place the cloth on the chain.

3 Hold and apply slight pressure while slowly turning the rear wheel, so the chain passes through the cloth.

4 If the chain is still dirty afterwards, clean with lubricant.

5 Service the chain after cleaning.

7.2.7 Cleaning the battery

⚠ CAUTION

Risk of fire and explosion due to penetration by water

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

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

Notice

- ▶ Never clean the battery with solvents, such as oil, thinners, alcohol or corrosion protection, or with cleaning agents.

- ▶ Clean the battery electrical connections with a dry cloth or paintbrush only.
- ▶ Wipe off the decorative sides with a damp cloth.

7.2.8 Cleaning the display

Notice

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

- ▶ Never immerse the display in water.
- ▶ Never clean with a pressure washer, water jet or compressed air.
- ▶ Never use cleaning agents.
- ▶ Remove the display from the S pedelec before cleaning.

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

7.2.9 Cleaning the drive unit

⚠ CAUTION

Burns from hot drive

The drive cooler can become extremely hot during use. Touching it 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 pressure washer, water jet or compressed air.
- ▶ Never use cleaning agents.
- ▶ Never open battery.

- ▶ Carefully clean the drive unit with a damp, soft cloth.

7.2.10 Cleaning the brake

⚠WARNING

Brake failure due to water penetration

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

- ▶ Never clean the S pedelec with a pressure washer 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.

7.3 Servicing

Required tools and cleaning agents:

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

7.3.1 Servicing the frame

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

7.3.2 Servicing the stem

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

7.3.3 Servicing the fork

- ▶ Treat the dust seals with fork oil.

7.3.4 Servicing the drive elements

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

7.3.5 Servicing the pedals

- ▶ Treat pedals with spray oil.

7.3.6 Servicing the chain

- ▶ Grease the chain thoroughly with chain oil.

7.3.7 Servicing the drive elements

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

7.4 Maintenance

CAUTION

Crash and falling caused by unintentional activation

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

▶ Remove the battery before maintenance.

The following maintenance measures must be performed on a regular basis.

7.4.1 Wheel

WARNING

Crash caused by braking hard on rims

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

▶ Check rim *wear* on a regular basis.

Notice

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

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

▶ Check the tyre pressure as per specifications.

▶ *Adjust the tyre pressure* as necessary.

1 Check the *tyres* for wear.

2 Check the *tyre pressure*.

3 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.

4 Check the tension of the spokes.

7.4.1.1 Checking the tyres

▶ Check the tyre wear. The tyre is worn if the anti-puncture protection or the carcass cords are visible.

⇨ A specialist dealer will need to change the tyre if it is worn.

7.4.1.2 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.

⇨ Contact your specialist dealer to have the rims replaced. We recommend that you also replace the *rims* at the same time as every second brake lining replacement.

7.4.1.3 Checking and adjusting the tyre pressure – Dunlop valve

Only applies to S pedelecs with this equipment

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.

1 Unscrew and remove the valve cap. Connect the bicycle pump.

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

3 Correct the tyre pressure according to specifications in the S Pedelec pass.

4 If the tyre pressure is too high, unfasten the union nut, let air out and re-tighten the union nut.

5 Remove the bicycle pump.

6 Screw the valve cap tight.

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

7.4.1.4 Checking and adjusting the tyre pressure – Presta valve

Only applies to S pedelecs with this equipment

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

1 Unscrew and remove the valve cap.

2 Open the knurled nut around four turns.

3 Carefully apply the bicycle pump so that the valve insert is not bent.

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

5 Correct the tyre pressure as per the specifications on the tyre.

6 Remove the bicycle pump.

7 Tighten the knurled nut with your fingers.

8 Screw the valve cap tight.

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

7.4.1.5 Checking and adjusting the tyre pressure – Schrader valve

Only applies to S pedelecs with this equipment

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

1 Unscrew and remove the valve cap.

2 Attach the bicycle pump.

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

⇨ The tyre pressure has been adjusted as per the specifications.

4 Remove the bicycle pump.

5 Screw the valve cap tight.

6 Screw the rim nut (1) gently against the rim with the tips of your fingers.

7.4.2 Brake system

CAUTION

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 hydraulic brake system on a regular basis. Contact your specialist dealer if any of these components have become worn.

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

7.4.3 Checking the brake linings for wear

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

1 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.

2 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. Contact your specialist dealer if any of these components have become worn.

7.4.4 Checking the pressure point

▶ Push brake lever and hold several times.

⇨ If you are unable to clearly detect the pressure point and it changes, the brake needs to be bled. Contact your specialist dealer.

7.4.5 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 their wear limit yet; brake discs need to be replaced if they have. Contact your specialist dealer.

7.4.6 Electrical cables and brake cables

▶ Check all visible electrical cables and cables for damage. If the sheathing is compressed, a brake is defective or a light does not work, the S pedelec must be removed from service until the lines or cables have been repaired. Contact your specialist dealer.

7.4.7 Gear shift

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

7.4.8 Stem

▶ The stem and quick release system must be inspected at regular intervals. The specialist dealer should adjust them if necessary.

▶ If the hexagon socket head screw is also loosened, the headset backlash also needs to be adjusted. Medium-strength thread locker, such as Loctite blue, then needs to be applied to the loosened screws and the screws tightened as per specifications.

▶ Contact your specialist dealer if there is any wear or signs of corrosion.

7.4.9 USB port

Notice

Any moisture penetrating through the USB port may cause a short circuit in the *display*.

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

7.4.10 Checking the belt and chain tension

Notice

Excessive chain tension increases wear.

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

▶ Check the chain tension once a month.

1 Check the chain tension in three or four positions, turning the crank a full revolution.

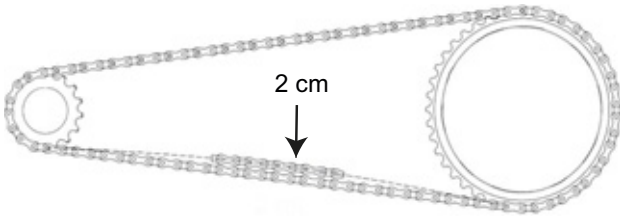


Figure 40: Checking the chain tension

2 If the *chain* can be pushed more than 2 cm, the *chain* or *drive belt* will need to be tensioned again by the specialist dealer.

3 If the *chain* or the *drive belt* can only be pushed up and down less than 1 cm, you will need to slacken the *chain* or the *drive belt*.

⇨ The optimum chain tension is achieved if the *chain* or the *drive belt* can be pushed a maximum of 2 cm in the middle between the pinion and the toothed wheel. The crank must also turn without resistance.

4 If a hub gear is featured, the rear wheel must be pushed backwards or forwards to tighten the chain. Contact your specialist dealer.

5 Check the handlebar grip is firmly in position.

8 Maintenance

WARNING

Injury due to damaged brakes

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

- ▶ Only specialist dealers may carry out repairs on brakes.
- ▶ Only carry out work or changes, such as dismantling, sanding or painting, which are permitted and described in the brake operating instructions.

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 during maintenance work.

CAUTION

Crash and falling caused by unintentional activation

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

- ▶ Remove the battery before inspection.

Crash caused by material fatigue

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

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

CAUTION

Hazard for the environment due to toxic substances

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

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

Notice

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

- ▶ Never open the motor.

You must have the specialist dealer perform maintenance every six months as a minimum. This is the only way to ensure that the S pedelec remains safe and fully functional. No matter whether disc brakes need replacing, brakes venting or wheels changing, many maintenance tasks require technical expertise, special tools and special lubricants. The S pedelec may become damaged if the stipulated maintenance intervals and procedures are not carried out. That is why only specialist dealers may carry out maintenance.

- ▶ The retailer will check the S pedelec based on the maintenance instructions in Section 11.3.
- ▶ The specialist dealer will inspect the S pedelec for any signs of material fatigue during basic cleaning.
- ▶ The specialist dealer will check the software version of the drive system and update it. The electrical connections are checked, cleaned and preservative agent is applied. The electrical cables are inspected for damage.
- ▶ The specialist dealer will dismantle and clean the entire suspension fork interior and exterior. They will clean and lubricate the dust seals and slide bushings, check the torques and adjust the fork to the rider's preferred position. They will also replace the sliding collar if the

clearance is too great (more than 1 mm on the fork bridge).

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

8.1 Suspension system

The correct execution of maintenance on the suspension system not only guarantees a long service life, but also ensures optimal performance. Each maintenance interval shows the maximum cycling hours for the corresponding type of recommended maintenance. Depending on terrain and environmental conditions, the performance can be optimised through shorter maintenance intervals.

8.1.1 Rear frame damper

Maintenance intervals

RockShox rear frame damper		
☐	Service air chamber assembly	every 50 hours
☐	Service damper and spring	every 200 hours
FOX rear frame damper		
☐	Complete maintenance (full interior and exterior inspection, damper overhaul, air spring overhaul, oil change and dust wiper replacement)	every 125 hours or once a year
Suntour rear frame damper		
☐	Complete shock absorber service including damper reassembly and air seal replacement	every 100 hours

⚠WARNING

Injury due to explosion

The air chamber is pressurised. If the air system is serviced in a rear frame damper, it can explode and cause serious injury.

- ▶ Wear safety goggles, protective gloves and safety clothing when assembling or carrying out maintenance on the bicycle.
- ▶ Release the air for the air chambers. Detach all air insert fitments.
- ▶ Never service or dismantle a rear frame damper if it has not completely rebounded.

⚠WARNING

Intoxication from suspension oil

Suspension oil irritates the respiratory tract, leads to germ cell mutations and sterility, causes cancer and is toxic to touch.

- ▶ Always wear safety goggles and nitrile gloves when working with suspension oil.
- ▶ Never perform maintenance when you are pregnant.
- ▶ Use an oil catchment tray under the section where the rear frame damper is serviced.

⚠CAUTION

Hazard for the environment due to toxic substances

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

- ▶ Dispose of 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 the rear frame damper.

The rear frame damper may become damaged if the procedure is not followed as described. Only specialist dealers may carry out maintenance on rear frame damper.

8.1.2 Suspension fork

Maintenance intervals

Suntour suspension fork		
☐	**Maintenance 1** Functional check, fastening and wear test	every 50 hours
☐	**Maintenance 2** Maintenance 1 + cleaning entire fork interior and exterior / cleaning and lubrication of dust seals and guides/ plastic bushings / check torques	every 100 hours
FOX suspension fork		
☐	Full maintenance (complete interior/ exterior inspection, damper overhaul, replacement of air seals on air forks, air suspension overhaul, oil change and dust wiper replacement).	every 125 hours or once a year
RockShox suspension fork		
☐	Maintenance of stanchions for: Paragon™, XC™ 28, XC 30, 30™, Judy®, Recon™, Sektor™, 35™*, Bluto™, REBA®, SID®, RS-1™, Revelation™, PIKE®, Lyrik™, Yari™, BoXXer	every 50 hours
☐	Maintenance of spring and damper unit for: Paragon, XC 28, XC 30,30 (2015 and earlier), Recon (2015 and earlier), Sektor (2015 and earlier), Bluto (2016 and earlier), Revelation (2017 and earlier), REBA (2016 and earlier), SID (2016 and earlier), RS-1 (2017 and earlier), BoXXer (2018 and earlier)	every 100 hours
☐	Maintenance of spring and damper unit for: 30 (2016+), Judy (2018+), Recon (2016+), Sektor (2016+), 35 (2020+)*, Revelation (2018+), Bluto (2017+), REBA (2017+), SID (2017+), RS-1 (2018+), PIKE (2014+), Lyrik (2016+), Yari (2016+), BoXXer (2019+)	every 200 hours

⚠ WARNING

Injury due to explosion

The air chamber is pressurised. If the air system is serviced in a faulty suspension fork, it can explode and cause serious injury.

- ▶ Wear safety goggles, protective gloves and safety clothing when assembling or carrying out maintenance on the S pedelec.
- ▶ Release the air for the air chambers. Detach all air insert fitments.
- ▶ Never service or dismantle a suspension fork if it has not completely rebounded.

⚠ CAUTION

Hazard for the environment due to toxic substances

The suspension fork 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 service and repair suspension forks.

The suspension fork may be damaged if procedures are not followed as described. Only specialist dealers may carry out maintenance on the suspension fork.

8.1.3 Suspension seat post

Maintenance intervals

Suntour suspension seat post		
☐	**Maintenance 1**	every 100 hours
RockShox suspension seat post		
☐	Venting of remote control lever and/or maintenance of lower seat post unit for: Reverb™ A1/A2/B1, Reverb Stealth A1/A2/B1/C1*, Reverb AXS™ A1*	every 50 hours
☐	Venting of remote control lever and/or maintenance of lower seat post unit for: Reverb B1, Reverb Stealth B1/C1*, Reverb AXS A1*	every 200 hours
☐	Complete maintenance of seat post for: Reverb A1/A2, Reverb Stealth A1/A2	every 200 hours
☐	Complete maintenance of seat post for: Reverb B1, Reverb Stealth B1	every 400 hours
☐	Complete maintenance of seat post for: Reverb AXS A1*, Reverb Stealth C1*	every 600 hours

Special tools, special lubricants and knowledge of suspension components are required to service and repair suspension seat posts.

The suspension seat post may be damaged if procedures are not followed as described. Only specialist dealers may carry out maintenance on the suspension seat post.

8.2 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.

Crash caused by faulty or incorrectly installed quick release

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

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

Crash caused by incorrectly set clamping force

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

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

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

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

8.2.1 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 41: Adjusting the quick release clamping force

▶ Use a 4 mm hexagon socket spanner to adjust the clamping lever clamping force if required.

Check the quick release lever position and clamping force.

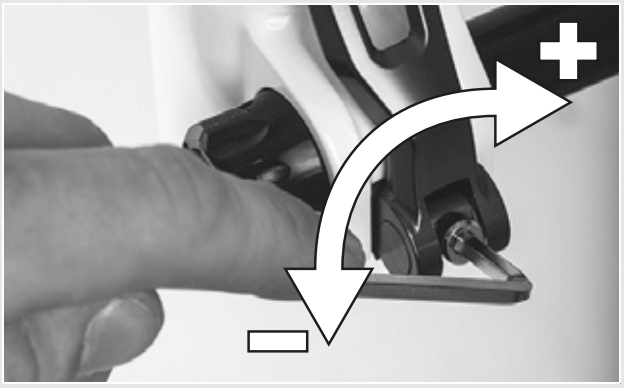


Figure 42: Adjusting the quick release clamping force

8.3 Adjusting the gear shift

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

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

8.3.1 Cable-operated gear shift, single-cable

Only applies to S pedelecs with this equipment

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

Figure 43: Adjusting sleeve (1) for the single-cable, cable-operated gear shift with shifter housing (2), example

8.3.2 Cable-operated gear shift, dual-cable

Only applies to S pedelecs with this equipment

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

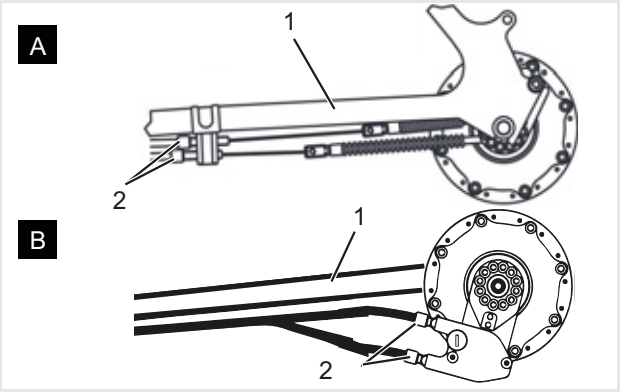


Figure 44: Adjusting sleeves (2) on two alternative versions (A and B) of a dual-cable, cable-operated gear shift on the chain stay (1)

8.3.3 Cable-operated twist grip, dual-cable

Only applies to S pedelecs with this equipment

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

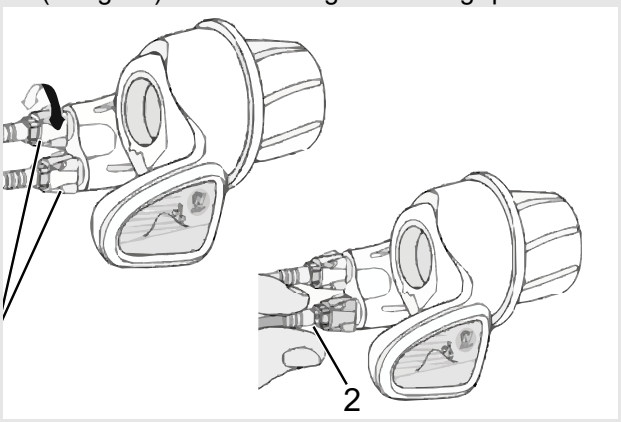


Figure 45: Twist grip with adjusting sleeves (1) and play of the gear shift (2)

9 Troubleshooting, fault clearance and repair

9.1 Troubleshooting and fault clearance

The components of the drive system are checked constantly and automatically. If an error is detected, an error message appears on the *display*. The drive may be shut off automatically, depending on the type of error.

9.1.1 The drive system or display do not start up

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

1 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.

2 If the LEDs on the battery level indicator light up, but the drive system does not start up, remove the battery.

3 Insert the battery.

4 Start the drive system.

5 If the drive system does not start up, remove the battery.

6 Clean all the contacts with a soft cloth.

7 Insert the battery.

8 Start the drive system.

9 If the drive system does not start up, remove the battery.

10 Fully charge the battery.

11 Insert the battery.

12 Start the drive system.

13 If the drive system does not start up, remove the display.

14 Fasten the display.

15 Start the drive system.

16 Contact your specialist dealer if the drive system does not start up.

9.1.2 Error message

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

1 Make a note of the system message. There is a table containing all system messages in Section 6.4.

2 Shut off and re-start the drive system.

3 If the system message is still displayed, remove the battery and then re-insert.

4 Re-start the drive system.

5 If the system message is still displayed, contact your specialist dealer.

9.1.3 Assistance function errors

Symptom	Cause	Remedy
Assistance is not available.	Is the battery charged sufficiently?	**1** Check battery is charged. **2** Recharge the battery if it is almost flat.
	Are you riding up long inclines in summer weather or have you been carrying a heavy load for a long time? The battery may be too hot.	**1** Switch off the drive system. **2** Wait a moment and then check again.
	The drive unit (DU-E8000), the bicycle computer (SC-E8000/SC-E6010) or the assistance switch (SW-E8000-L/SW-E6000/SW-E6010) may be connected incorrectly or one or more of them may have a problem.	▶ Contact your specialist dealer.
	Is the speed too high?	▶ Check on-screen indicators. The electronic gear assistance only works up to a maximum speed of 25 km/h.
Assistance is not available.	Are you pedalling?	▶ The S pedelec is not a motorbike. You also need to pedal.
	Is the assistance mode set to [OFF]?	**1** Set the assistance mode to a different level of assistance than [OFF]. **2** Contact your specialist dealer if you still feel that the S pedelec does not supply assistance.
	Is the system switched on?	▶ Press the battery on-off button to switch it on again.
The assisted journey distance is too short.	The journey distance can be shorter depending on the road conditions, the gear level and the entire light usage time.	**1** Check the battery level. **2** If the battery is almost flat, recharge it.
	The battery does not perform as well in winter weather.	This does not indicate a problem.
	The battery is a consumable. Repeated charging and long periods of use cause the battery to degrade (loss of power).	▶ If the distance you can cover with one single charge is very short, replace the battery with a new one.
	Is the battery fully charged?	▶ If the distance covered with a fully charged battery has become shorter, the battery may be affected. Replace the battery with a new one.
It is difficult to pedal.	Are the tyres pumped to an adequate pressure?	▶ Pump up the tyres.
	Is the assistance mode set to OFF?	**1** Select the level of assistance [BOOST]. **2** Contact your specialist dealer if you still feel that the S pedelec does not provide assistance.
	The battery charge might be low.	▶ Check how powerful assistance is again after charging the battery. Contact your specialist dealer if you still feel that the S pedelec does not provide assistance.
	Have you switched on the system with your foot on the pedal?	**1** Switch the system on again without applying pressure to the pedal. Contact your specialist dealer if you still feel that the S pedelec does not supply assistance.

Table 20: Level of assistance error solution

9.1.4 Battery error

Symptom	Cause	Remedy
The battery discharges quickly.	The battery may be at the end of its useful life.	▶ Replace the battery with a new one.
The battery cannot be recharged.	Is the charger mains plug firmly connected to the socket?	**1** Pull out the charger mains plug and reconnect it again. **2** Try charging again. **3** If the battery still won't recharge, contact your specialist dealer.
	Is the charger plug firmly connected to battery?	**1** Pull out the charger mains plug and reconnect it again. **2** Try charging again. **3** If the battery still won't recharge, contact your specialist dealer.
	Is the adapter firmly connected to the charger plug or the battery's charging port?	**1** Connect the adapter firmly to the charger plug or the battery's charging port. **2** Re-start the charging process. **3** Contact your specialist dealer if the battery still does not charge.
	Is the battery, the connection terminal for the battery charger, charger adapter or battery dirty?	**1** Wipe the connection terminal with a dry cloth to clean it. **2** Try charging again. **3** If the battery still won't recharge, contact your specialist dealer.
The battery does not start charging when the charger is connected.	The battery may be at the end of its useful life.	▶ Replace the battery with a new one.
The battery and charger become hot.	The temperature of the battery or the charger may have exceeded the operating temperature range.	**1** Stop the charging process. **2** Wait a while and then start charging again. **3** If the battery is too hot to touch, there might be a problem with the battery. Contact your specialist dealer.
The charger is hot.	If the charger is used continuously to charge batteries, it may become hot.	▶ Wait a while before using the charger again.
The LED on the charger does not light up.	Is the charger plug firmly connected to battery?	**1** Check the connection to the external body before inserting the charger plug again. **2** If nothing changes, contact your specialist dealer.
	Is the battery fully charged?	The LED on the battery charger will go out when the battery is fully charged. This is not a malfunction. **1** Pull out the charger mains plug and reconnect it again. **2** Then try charging again. **3** If the LED on the charger still does not light up, contact your specialist dealer.
The battery cannot be removed.		▶ Contact your specialist dealer.
The battery cannot be inserted.		▶ Contact your specialist dealer.

Table 21: Error solution for battery

Symptom	Cause	Remedy
Fluid is leaking from the battery.		**WARNING**
		1 Move away from the battery immediately. **2** Contact the fire service immediately. **3** Observe all the safety instructions in Section 2 Safety.
There is an unusual smell.		**WARNING**
		1 Move away from the battery immediately. **2** Contact the fire service immediately. **3** Observe all the safety instructions in Section 2 Safety.
Fumes are emitted from the battery.		**WARNING**
		1 Move away from the battery immediately. **2** Contact the fire service immediately. **3** Observe all the safety instructions in Section 2 Safety.

Table 21: Error solution for battery

9.1.5 Display errors

Symptom	Cause	Remedy
No data are shown on the monitor if you press the on-off button on the battery.	The battery charge level may be insufficient.	**1** Charge the battery. **2** Switch the power on.
	Is the power switched on?	▶ Keep the battery on-off button pressed down to switch on the power again.
	Is the battery charged?	▶ If the battery is fitted to the S pedelec and is being charged, it cannot be switched on. Stop the charging process.
	Is the connector fitted to the power cable correctly?	▶ Check whether the power cable connector connecting the motor unit to the drive unit has not disconnected. If you are not sure, contact your specialist dealer.
	A component may be connected which the system is unable to recognise.	▶ Contact your specialist dealer.
The gear level is not shown on the display screen.	The gear level is only shown if the electronic gear shift is used.	▶ Check whether the power cable pug has been disconnected. If you are not sure, contact your specialist dealer.
The settings menu cannot be opened while you are riding.	The product is designed in such a way that the settings menu cannot be opened if the system detects that someone is riding the S pedelec. This is not a malfunction.	▶ Stop the S pedelec and then adjust the settings.
The time display is flashing "0:00".	The coin cell in the display has come to the end of its service life.	▶ Replace the coin cell in the display.

Table 22: Display error solution

9.1.6 Lighting does not work

Symptom	Cause	Remedy
The front light or rear light does not go on, even when the switch is pressed.	The basic settings in the electric drive system have probably been configured incorrectly. The light is defective.	**1** Take the S pedelec out of service immediately. **2** Contact your specialist dealer.

Table 23: Error solution for battery

9.1.7 Other errors

Symptom	Cause	Remedy
Two beeps will sound if a switch is pressed but the switch cannot be operated.	Pressed switch mode has been deactivated.	▶ This is not a malfunction.
Three beeps are sounded.	A fault or warning has occurred.	▶ This occurs when a warning or an error is shown on the display screen. Follow the instructions for the code indicated on screen in Section 6.2 System Messages.
When you use an electronic gear shift, you can feel that pedal assistance becomes weaker when the gear is changed.	This is because the computer sets the pedal assistance to the optimum level.	▶ This is not a malfunction.
A noise can be heard after switching.		▶ Contact your specialist dealer.
It is normal to hear a noise coming from the rear wheel when cycling as normal.	The gear shift setting may not have been made properly.	▶ Contact your specialist dealer.
If you stop the S pedelec, gear transmission does not switch to the position pre-configured in the functional feature.	You may have applied too much pressure onto the pedals.	▶ It is easier to change gears if you press onto the pedals gently.

Table 24: Error solution for battery

9.2 Repair

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

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

9.2.1 Original parts and lubricants

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

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

The constantly updated accessory approval and parts lists are in Section 11 Documents and Drawings.

Observe the operating instructions for the new components.

9.2.2 Replacing the lighting

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

9.2.3 Adjusting the headlight

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

9.2.4 Tyre clearance check

The tyre needs to be checked each time a suspension fork tyre is changed to another size.

1. Release pressure from the fork.
2. Press fork together fully.
3. Measure the gap between the top of the tyre and the crown's lower surface. The gap must not be less than 10 mm. If the tyre is too large, the tyre will touch the crown's lower surface if the fork is fully pressed together.
4. Release pressure on fork and pump it up again if it is an air suspension fork.
5. Take into account the fact that the gap will be smaller if there is a guard. Check again to ensure that there is sufficient clearance for the tyre.

10 Recycling and disposal

This device is marked according to the European Directive 2012/19/EU on waste electrical and electronic equipment – WEEE and the European

Directive 2006/66/EC on accumulators. The directive provides the framework for the return and recycling of used devices across the EU. As a consumer, you are legally required to return all used batteries of any type. It is forbidden to dispose of batteries in domestic waste. The manufacturer is obliged to take back used and old batteries free of charge as per Section 9 German Batteries Act. You thus meet statutory obligations and help to protect the environment. The S pedelec, battery, motor, display screen and charger are recyclable materials. You must dispose of and recycle them separately from the domestic waste in compliance with applicable statutory regulations. Separate collection and recycling saves reserves of raw materials and ensures that all the regulations for protection of health and the environment are adhered to when recycling the product and/or the battery.

- ▶ Never dismantle the S pedelec, batteries or charger for disposal.
- ▶ The S pedelec, display screen, the unopened and undamaged battery and the charger can be returned to any specialist dealer free of charge. Depending on the region, further disposal options may be available.
- ▶ Store the individual parts of the decommissioned S pedelec in a dry place, free from frost, where they are protected from direct sunlight.

11 Documents

11.1 Parts and repair list

Component	Manufacturer	Model	Detail
Frame	Great Impact Group Inc.	Frame Velossi 2.0,	Diamant RH 50/55/60 Trapez RH 45/50
Front wheel fork	SR Suntour Inc.	Fork Suntour SF18 Mobie45	28”/700C, 60mm
Handlebars	Humpert	Ergo Plus XL Lv6	630mm
Stem	Humpert	Stem Swell XR Lv6	100mm
Handles	Ergon	GP3-L	Long/short
Headset	Chin Haur Industries Co.	CH-6503TEBW	11/ 8"-1.5"
Seat post	Humpert	Skalar 34.9	Diamant 50 = 250 mm Diamant 55 = 300 mm Diamant 60 = 350 mm Trapez 45 = 350 mm Trapez 50 = 400 mm
Brake			
Front			
Disc brake	Magura	MT5e	4 pistons
Brake linings	Magura	Magura 9.S	Green
Brake disc	Magura	Rotor Storm 180HC	90 Radius
Brake lever	Magura	MT5e	3-finger blade black With ball end With switch
Brake cable	Magura	Magura disc tube black	950mm Magura Royal Blood hydraulic fluid
Rear			
Disc brake	Magura	MT5e	4 pistons
Brake linings	Magura	Magura 9.S	Green
Brake disc	Magura	Rotor Storm 180HC	90 Radius
Brake lever	Magura	MT5e	3-finger blade black With ball end With switch
Brake cable	Magura	Magura disc tube black	2000mm Magura Royal Blood hydraulic fluid
Wheel			
Front			
Hub	Shimano	Deore M6010,	100 x 15 Thru axle
Spoke	Mach 1	Plus	14G 2.0 x 290 mm
Spoke nipples	Mach 1	Standard	2 mm
Rim	Mach 1	Neo Disc	622-19 36 holes Single eyelets
Tyres	Schwalbe	Energizer Plus	50-622 (28 x 2.00)
Rear			
Hub	Alber	Neodrive Z20RS	
Spoke	Mach 1	Track	14G 2.3/ 2.0 x 202 mm Single-butted
Spoke nipples	Sapim n.v	Polyax	14G Secure lock
Rim	Mach 1	Neo Disc	622-19 36 holes Single eyelets Wide angle
Tyres	Schwalbe	Energizer Plus	50-622 (28 x 2.00)
Drive			
Motor	Alber	Neodrive Z20RS	
Display	Alber	Neodrives Bloks TFT	TFT colour display
Rechargeable battery	BMZ	UR-V8 13S4P	47.2V 13.8Ah 651Wh
Charger	BMZ	Charger 13S	27143-4
Chain/belt	Universal Transmission GmbH	CDX toothed belt CDXBbk120	11M-120T-12CT

Component	Manufacturer	Model	Detail
Cable			
Light cable, front	Supernova Design GmbH&Co. KG		
Brake light cable	Supernova Design GmbH&Co. KG		
Display cable	Alber		
Battery cable	Alber	Cable harness Z20RS – V8 RS	1593328
Light system			
Headlight	Supernova Design GmbH&Co. KG	M99 Mini PRO-45	M99MIP-E-MBLK-2T1200
Rear light	Supernova Design GmbH&Co. KG	Uni Legal Kit	M99-TE12-BLK-03T1350
Brake light	Supernova Design GmbH&Co. KG	Uni Legal Kit	M99-TE12-BLK-03T1350
Registration plate light	Supernova Design GmbH&Co. KG	Uni Legal Kit	M99-TE12-BLK-03T1350
Non-triangular rear reflector	Comus	Rear reflector R-99 "Z"	
Non-triangular side reflector	Busch+Müller	Yellow rear reflector 306/2KG-1	IA E1024563
Pedal reflector	VP	VP-831P	TPP15051
Gear shift			
Crank/gear shift	Pinion	P1.9 XR Set	Crank set CNC
Pinion/toothed wheel	Universal Transmission GmbH	CDXR239S	23T 9-spline CT1123SMN
Chainring set	Pinion Universal Transmission GmbH	Pinion spider P8100 Front sprocket CDXF439 Guard CDSG394BAL	BCD 104mm 39T
Shifter, right-hand	Pinion	Shift handle DS2.9	Part of the P1.9 XR Set
Additional components			
Pedal	VP Components	VP-831P	
Pannier rack	Standwell Industries	KM081S	
Rear mirror	Busch+Müller	913/712VLGE-1	
Horn	Supernova Design GmbH&Co. KG	M99 horn	12VHRN-R-MBLK-1300
Vehicle stand	Ursus	Wave Rear	
Registration plate holder	Supernova Design GmbH&Co. KG	Uni Legal Kit	M99-TE12-BLK-03T1350
Battery lock	AXA Stenman Holland B.V.	Axa lock for BMZ UR-V8	55911495
Bicycle lock	–	–	–

11.2 Assembly report

Date:

Frame number:

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

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

Technical inspection, checking safety, test ride

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

Date:	
Fitter's name:	
Final inspection by workshop manager	

11.3 Maintenance instructions

Diagnosis and documentation of current status

Date: Frame number:

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

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

Technical inspection, checking safety, test ride

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

Date:	
Fitter's name:	
Final inspection by workshop manager	

12 Glossary

Brake lever

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

Braking distance

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

Cargo bike

Source: DIN 79010: bicycle mainly designed to carry goods.

CE marking

Source: Directive 2006/42/EC on Machinery: the manufacturer uses the CE marking to declare that the Pedelec complies with the applicable requirements.

City and trekking bicycles

Source: EN-ISO 4210 - 2: pedelec designed for use on public roads primarily for means of transportation or leisure.

Consumables

Source: EN 82079-1: any part or material that is necessary for continued use or maintenance of the product.

Decommissioning

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

Disc brake

Source: EN 15194:2017: brake in which brake pads are used to grip the lateral faces of a thin disc attached to or incorporated in the wheel hub.

Drive belt

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

Electrical control system

Source: EN 15194:2017: electronic and/or electrical component, or an assembly of components provided for installation into a vehicle, together with all electrical connections and associated wiring for the motor electrical power assistance.

Electrically power assisted cycle, pedelec

Source: EN 15194:2017: electrically power assisted cycle, equipped with pedals and an auxiliary electric motor, which cannot be propelled exclusively by means of the auxiliary electric motor, except in start-up assistance mode.

Fault

Source: EN 13306:2018-02, 6.1: state of an item (4.2.1) characterized by inability to perform a required function (4.5.1), excluding the inability during preventive maintenance or other planned actions, or due to lack of external resources.

Folding bicycle

Source: EN-ISO 4210-2: bicycle designed to fold into a compact form, facilitating transport and storage.

Fork steerer

Source: EN 15194:2017: part of a fork that rotates about the steering axis of a bicycle frame head tube. It is normally connected to the fork crown or directly to the fork legs, and is normally the point of connection between the fork and the handlebar stem.

Fracture

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

Instruction handbook

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

Maintenance

Source: DIN 31051: maintenance is generally performed at regular intervals and often carried out by trained technical staff. This ensures a maximum service life and low wear and tear for the maintained items. Proper maintenance is often also a pre-requisite for providing a warranty.

Maximum continuous power

Source: ZEG: the maximum continuous power is the maximum power for the electric motor output shaft during 30 minutes.

Maximum saddle height

Source: EN 15194:2017: vertical distance from the ground to the point where the top of the seat surface is intersected by the seat-post axis, measured with the saddle in a horizontal position and with the seat-post set to the minimum insertion-depth mark.

Maximum tyre pressure

Source: EN 15194:2017: maximum tyre pressure recommended by the tyre or rim manufacturer for a safe and efficient performance. If the rim and tyre both indicate a maximum tyre pressure, the maximum inflation pressure is the lower of the two pressures indicated.

Minimum insertion depth mark

Source: EN 15194:2017: mark indicating the minimum insertion-depth of handlebar stem into fork steerer (fork stem) or seat post into frame.

Model year

Source: ZEG: the model year refers to the first production year that the series-manufactured pedelec was manufactured in the version in question and is not always identical with the year of manufacture. The year of manufacture may be before the model year in some cases. If no technical modifications are introduced to the series, production may continue of pedelecs from a previous model year.

Mountain bike

Source: EN-ISO 4210-2: bicycle designed for use off-road on rough terrain, on public roads, and on public pathways, equipped with a suitably strengthened frame and other components, and, typically, with wide-section tyres with coarse tread patterns and a wide range of transmission gears.

Off-road rough terrain

Source: EN 15194:2017: coarse pebble tracks, forest trails, and other general off-road tracks where tree roots and rocks are likely to be encountered.

Permitted total weight

Source: EN 15194:2017: weight of the fully assembled pedelec plus the rider and baggage, as specified by the manufacturer.

Quick-release device, quick release

Source: EN 15194:2017: lever actuated mechanism that connects, retains or secures a wheel or any other component.

Racing bicycle

Source: EN-ISO 4210-2: bicycle intended for high-speed amateur use on public roads having a steering assembly with multiple grip positions allowing for an aerodynamic posture, a multi-speed transmission system, tyre width not greater than 28 mm and a maximum mass of 12 kg for the fully assembled bicycle.

Seat post

Source: EN 15194:2017: component that clamps the saddle (with a bolt or assembly) and connects it with the frame.

Shut-off speed

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

Spare part

Source: EN 13306:2018-02, 3.5: item intended to replace a corresponding item in order to retain or maintain the original required function of the item.

Suspension fork

Source: EN 15194:2017: front fork incorporating controlled, axial flexibility to reduce the transmission of road-shocks to the rider.

Suspension frame

Source: EN 15194:2017: frame incorporating controlled, vertical flexibility to reduce the transmission of road-shocks to the rider.

Type number

Source: ZEG: all pedelec models have an eight-digit type number which is used to specify the design model year, the type of pedelec and the version.

Wear

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

Weight of ready-to-ride bicycle

Source: ZEG: the indicated weight for a ready-to-ride bicycle refers to the weight of a pedelec at the time of sale. The weight of each additional accessory must be added to this weight.

Wheel

Source: EN 15194:2017: assembly or combination of hub, spokes or disc, and rim, but excluding tyre assembly.

Work environment

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

Year of manufacture

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

Young adult bicycle

Source: EN-ISO 4210-2: bicycle designed for use on public roads by a young adult whose weight is less than 40 kg, with maximum saddle height of 635 mm or more and less than 750 mm. (see ISO 4210).

12.1 Abbreviations

ABS anti-blocking system

ECP electronic cell protection

12.2 Simplified terms

The following terms are used for better legibility:

Term	Meaning
Operating instructions	Original operating instructions
Motor	Drive motor, sub-system

Table 25: Simplified terms

12 Keyword index