cross

A NEW GENERATION OF E-BIKES

BICYCLE USER MANUAL
Translation of the original
operating instructions
EN 15194 and EN ISO 4210-2

Congratulations on the purchase of your new CROSS e-bike. Discover freedom on two wheels. No matter whether for the city or for long tours, your e-bike offers the highest quality, maximum comfort and the latest state-of-the-art technology.

Read this CROSS manual thoroughly before setting off for your first ride.

ATTENTION!
Read pages 5 to 17 before your first ride!
Perform the functional check on pages 17 to 20 before every ride!


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COMPONENTS

Frame:

ⓐ Seat tube
ⓑ Rear stay
ⓒ Chainstay
ⓓ Head tube
ⓔ Central tube

Suspension fork:

Ⓐ Fork crown
Ⓑ Stanchion tube
Ⓒ Lower leg
Ⓓ Dropout

Ⅰ Motor/drive unit
Ⅱ Rechargeable battery
Ⅲ Display

1 Saddle
2 Suspension seat post
3 Seat post clamp
4 Pannier rack
5 Rear light with reflector
6 Lock
7 Rear brake
8 Brake disc/rotor
9 Internal gear hub
10 Kickstand
11 Belt
12 Belt sprocket
13 Pedal
14 Crankset
15 Handlebar
16 Twist grip
17 Brake lever
18 Stem
19 Headset
20 Front lamp
21 Mudguard
22 Valve
23 Front brake
24 Brake disc/rotor
25 **Wheel:**
26 Quick-release/ thru axle
27 Spoke
28 Rim
29 Reflector ring
30 Tyre
31 Hub

Pay particular attention to the following symbols:

⚠ WARNING

This symbol indicates a hazardous situation which could result in death or serious injury – if the relevant operational instructions are not followed or if the relevant protective measures are not taken.

⚠ CAUTION

This symbol indicates a hazardous situation which could result in minor or moderate injury – if the relevant operational instructions are not followed or if the relevant protective measures are not taken.

NOTICE

This symbol is used to address practices not related to physical injury – which may, however, result in damage to property and the environment.

SAFETY INSTRUCTIONS

This symbol indicates specific safety-related instructions or procedures about how to handle the product or refers to a section in the operating instructions that deserves your particular attention.

The described possible consequences will not be repeated in the translation of the original CROSS operating instructions for EPACs every time one of the symbols appears.

For the sake of better legibility, the male form is used with personal names and personal nouns throughout these operating instructions. The terms in question principally apply to all genders in the spirit of equal treatment. The abbreviated language form is used solely for editorial reasons and does not represent any value judgement.

NOTES ON THE TRANSLATION OF THESE ORIGINAL CROSS OPERATING INSTRUCTIONS

The illustrations show typical CROSS EPACs/EAPCs (c+d) – one of these types corresponds to the CROSS EPAC/EAPC you bought. Today's EPACs/EAPCs come in various types that are designed for specific uses and equipped accordingly.

The translation of these original CROSS operating instructions is not intended to help you assemble a CROSS EPAC/EAPC from individual components, to repair it or to make partly assembled bicycles ready-for-use.

For other than the shown or designated EPAC/EAPC types the translation of these original CROSS operating instructions is not applicable.

Technical details in the text and illustrations of these operating instructions are subject to change.

The translation of these original CROSS operating instructions together with the other user manuals complies with the requirements of the EN ISO standards 4210-2, the EN 15194 Cycles – Electrically power assisted cycles – EPAC bicycles in the respective current version as well as with the Regulation on Machinery 2023/1230/EC.

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The translation of these original CROSS operating instructions is subject to European law. If delivered to countries outside Europe, supplementary information has to be provided by the bicycle manufacturer.

The translation of these original CROSS operating instructions includes instructions as to the characteristics of CROSS EPACs/EAPCs and bicycle technology in general. It forms a system together with the drive system manufacturer's system instructions that you received with your CROSS EPAC/EAPC.

Also observe the manuals of the component manufacturers possibly enclosed.

Bicycles with drive assistance designated as EPAC bicycles in the European standard EN 15194 are referred to as EPACs/EAPCs in the translation of these original CROSS operating instructions. For a precise description of the different EPAC types see the chapter **"Intended Use"**.

SAFETY INSTRUCTIONS

Keep the translation of these original CROSS operating instructions for future reference and hand it over to the respective user, in case you sell, lend or pass on the CROSS EPAC/EAPC otherwise.

Edition 7.1, September 2024

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GENERAL SAFETY INSTRUCTIONS

Dear CROSS Customer,

In purchasing this CROSS EPAC/EAPC **(e-g)** you have chosen a product of high quality and technology. Each component of your new CROSS EPAC/EAPC has been designed, manufactured and assembled with great care and expertise. It has been fully assembled and subjected to a functional check by your CROSS dealer. So you can pedal with joy and a secure feeling from the very first metres and enjoy the tailwind from the auxiliary drive.

This CROSS manual contains a wealth of information on the proper use of your CROSS EPAC/EAPC, its maintenance and operation as well as interesting information on bicycle and EPAC/EAPC design and engineering. Read this CROSS manual thoroughly. We are sure that even if you have been cycling (bicycle or EPAC/EAPC) all your life you will find useful and detailed information. In particular the technology of EPACs/EAPCs has developed bicycles at a rapid pace in recent years. Therefore, before setting off on your new CROSS EPAC/EAPC, be sure to read at least the chapters **"Before Your FIRST Ride"** and **"Intended Use"**.

To have as much fun as possible during cycling, be sure to carry out the functional check described in the chapter **"Before EVERY Ride"** before setting off.

Even a manual as big as an encyclopaedia could not describe any possible combination of EPAC/EAPC models and components or parts on the market. Therefore, this CROSS manual together with the system instructions of the drive system manufacturer focus on your newly purchased CROSS EPAC/EAPC and standard components and provide useful information and warnings.

When doing any adjusting and maintenance work **(h)**, be aware that the detailed instructions provided in your operating instructions only refer to this CROSS EPAC/EAPC.

The information included here is not applicable to any other EPAC/EAPC or e-bike type. As bicycles come in a wide variety of designs with frequent model changes, the described operations may require complementary information. Be sure to also observe the manuals of the component suppliers that you may have obtained from your CROSS dealer.

Be aware that these instructions may require further explanation, depending on the experience and/or skills of the person doing the work. For some jobs you may require additional (special) tools or supplementary instructions. This CROSS manual cannot teach you the skills of a bicycle mechanic. If you have the slightest doubt ask your CROSS dealer.

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Before you set off, let us point out a few things to you that are very important to every cyclist: Never ride without a properly adjusted helmet and without glasses (a) and take care to always wear suitable, bright clothing. As a minimum you should wear straight cut trousers or use trouser clips and shoes (b) fitting the pedal system. Always ride carefully on public roads and observe the traffic rules so as not to endanger yourself or others.

This CROSS manual cannot teach you how to ride the EPAC/EAPC or bicycle. Be aware that riding an EPAC/EAPC is a potentially dangerous activity, especially on public roads that requires the rider to stay in control of his or her EPAC/EAPC at all times. Be aware from the moment you set off that you ride at a higher speed. Always keep this fact in mind and ride considerately!

Like any sport, riding an EPAC/EAPC involves the risk of injury and damage. When you set off on an EPAC/EAPC you should be aware and accept this risk. Please note that on a CROSS EPAC/EAPC you have no safety devices around you (e.g. bodywork, ABS, airbag) like you have in a car. Therefore, always ride carefully and respect the other road users.

Never ride under the influence of drugs, medication, alcohol or when you are tired. Do not ride with a second person on your CROSS EPAC/EAPC when it is not equipped with a specific seat and never ride without having both hands on the handlebar.

Observe the legal regulations concerning cycling with EPACs/EAPCs off public roads (c). These regulations differ in the different countries. Respect nature when riding through the forest and meadows. Be sure to use your CROSS EPAC/EAPC only on signposted, well maintained trails and hard-surface roads.

Always bear in mind that you travel rapidly and quietly. Do not startle pedestrians or other cyclists. Always make others aware of your presence well ahead of time and by ringing your bell or make use of the brakes so as to avoid accidents. Familiarize yourself with your CROSS EPAC/EAPC.

First we would like to familiarise you with the components of your CROSS EPAC/EAPC. Unfold the cover of the translation of the original CROSS operating instructions. There you will find one exemplary CROSS EPAC/EAPC showing all necessary components. Leave the page unfolded as you read so that you can easily locate the components as they are referred to in the text (d).

⚠ WARNING

For your own safety, never do any maintenance work or adjusting on your CROSS EPAC/EAPC unless you feel absolutely sure about it. If you are in doubt or if you have any questions, contact your CROSS dealer.

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INTENDED USE

Note that each EPAC/EAPC or EPAC/EAPC type referred to as **category** in the following, is designed for a specific use. Be sure to use your CROSS EPAC/EAPC only according to its intended use, as it may otherwise not withstand the stress, fail and cause an accident with unforeseeable consequences! In addition, improper use will invalidate the warranty. Ask your CROSS dealer to confirm the category to which your EPAC/EAPC belongs. Have a look at your EPAC/EAPC card.

EPAC/EAPC Classes

EPACs (**E**lectrically **P**ower **A**ssisted **C**ycles) in the UK also referred to as **EAPCs** (**E**lectrically **A**ssisted **P**edal **C**ycle**s**) are bicycles with auxiliary motor that only switches on when the pedals are moved by the rider. When you stop pedalling, the motor/drive unit switches off.

The maximum permissible speed assisted is 25 km/h (15.5 mph); beyond this speed the motor/drive unit switches off. With their maximum motor output of 250 watts EPACs/EAPCs are considered bicycles in road traffic.

The legal regulations for riding an EPAC/EAPC with regard to driving licence, registration, type approval, requirement to wear a helmet (e), insurance, regulations on the use of cycle lanes etc. are listed in the **"Overview on EPACs/EAPCs, Speed Pedelecs and 'Twist and Gos' – Legal Regulations in Great Britain"** at the end of this chapter. Do not confuse your CROSS EPAC/EAPC with a "speed pedelec" (45 km/h (28 mph)).

The starting or pushing aid (f) provides assistance during pushing (g) or when doing a hill start, even without pedalling, up to a speed of 6 km/h / 3.7 mph.

Categories

Category 1: e-city and e-fitness bicycles

EPACs/EAPCs (h) and components of the category 1 are used for commuting and for leisure rides. EPACs/EAPCs and components of this category are intended for riding on paved surfaces, i.e. on asphalted or cobbled roads, where the front and rear wheels remain in permanent contact to the ground. Drops are intended to be limited to a maximum of 15 cm. EPACs/EAPCs and components of the category 1 are not suitable for off-road use (in the terrain) and not for competitive use of any kind whatsoever.

Category 1 describes e-city and e-fitness bicycles. In general, these are bicycles with wheel sizes of 26 or 28 inches.

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Category 2 "Everyday": e-trekking, e-touring, e-cross and e-youth bicycles

EPACs/EAPCs and components of the category 2 "Everyday" are used for leisure and trekking rides with moderate effort. EPACs/EAPCs and components of this category are intended for riding on paved and unpaved surfaces as well as on gravel paths of moderate classification. Under these conditions contact with uneven terrain and loss of tyre contact with the ground may occur. Drops are intended to be limited to a maximum of 15 cm. EPACs/EAPCs and components of the category 2 "Everyday" are not suitable for off-road use (in the terrain) and not for competitive use of any kind whatsoever.

Category 2 "Everyday" describes e-trekking, e-touring, e-cross and e-youth bicycles. In general, these are electric bicycles with wheel sizes of 26 or 28 inches (e-trekking, e-touring and e-cross bicycles) or 24 inches (e-youth bicycles).

Due to their design and equipment, EPACs/EAPCs of the categories 1 and 2 "Everyday" **(a+b)** are not always suitable for being used on public roads. If you want to use them on public roads, these bikes must be equipped according to the respective rules. Observe the traffic rules when riding on public roads.

For more information see the chapter **"Legal Requirements for Riding on Public Roads"**.

The **maximum permissible overall weight** is specified on the type plate on the CROSS EPAC/EAPC or in the EPAC/EAPC card.

⚠ WARNING

- ***Do not modify or manipulate ("tune") your CROSS EPAC/EAPC. Risk of accident! Modifications and manipulations (e.g. dongles, etc.) will render the warranty void and result in a loss of the private liability insurance cover. The EPACs/EAPCs are then possibly no longer approved for use on public roads and on forest trails. For more information read "Risks related to the tuning of e-bikes 25 (15.5)/EPACs/EAPCs" in the chapter "Guidelines".***
- ***Your CROSS EPAC/EAPC is designed for a maximum permissible overall weight including the rider, the luggage (c), the CROSS EPAC/EAPC and the child seat or trailer load, if permitted. The maximum permissible overall weight is specified on the type plate on the CROSS EPAC/EAPC or in the EPAC/EAPC card in these operating instructions. If you are in doubt, contact your CROSS dealer.***

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⚠ WARNING

- *Be sure to use your CROSS EPAC/EAPC only for its intended purpose, as it may otherwise not withstand the loads and fail (d). Risk of accident!*
- *Regular maintenance of your CROSS EPAC/EAPC is essential for its suitability and crucial for its safety. You as owner are the only one who knows how often you use your CROSS EPAC/EAPC, where you use it and how hard you do. It is therefore your responsibility, to have regular servicing and maintenance carried out. For more information see the chapter "Service and Maintenance Schedule" or contact your CROSS dealer.*
- *Due to their design and equipment, CROSS EPACs/EAPCs are not always suitable for being used on public roads. If you want to use them on public roads, these bikes must be equipped according to the respective rules (e). Observe the traffic rules when riding on public roads.*
- *Note: During cycling you must not hold onto a moving vehicle or trailer. Keep both hands on the handlebar. Only take your feet off the pedals, if required by the condition of the road. Also bear in mind that riding with headphones is in some countries allowed as long as the acoustic perception is not impaired. Inform yourself about the law situation in the country where you use your CROSS EPAC/EAPC.*

⚠ WARNING

- *Bicycles of the categories 1 and 2 "Everyday" are not suitable for off-road use of any kind whatsoever, jumps, slides, stair riding, stoppies, wheelies, tricks etc.!*

NOTICE

- *We recommend that you take out private liability insurance. Make sure that your insurance provides cover for damage caused while riding an EPAC/EAPC. Contact your insurance company or agency.*

SAFETY INSTRUCTIONS

- *The regulations and rules for EPACs/EAPCs and speed pedelecs are continuously revised. Read the daily press to keep yourself informed about current legislative changes.*
- *For more information on the approval of using trailers (f) and child seats (g) on your CROSS EPAC/EAPC, have a look at the EPAC/EAPC card (h).*
- *For more information about the intended use of your CROSS EPAC/EAPC as well as the permitted maximum overall weight (rider, luggage, CROSS EPAC/EAPC and child seat or trailer load, if permitted) see the type plate on the CROSS EPAC/EAPC or the EPAC/EAPC card in these operating instructions.*

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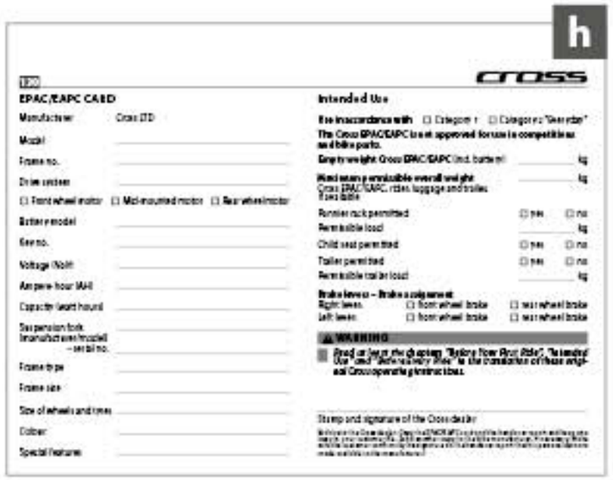

CROSS

EPAC/EAPC CARD

Manufacturer: Cross GTD

Model

Frame no.

Drive system

☐ Front wheel motor ☐ Mid-mounted motor ☐ Rear wheel motor

Battery model

Item no.

Voltage (Volt)

Ampere-hour (Ah)

Capacity (watt hours)

Suspension fork (manufacturer/model – serial no.)

Frame type

Frame size

Size of wheels and tires

Colour

Special features

Intended Use

Use in accordance with ☐ Category 1 ☐ Category 2 "Everyday"

The Cross EPAC/EAPC is not approved for use in competition or as a bike parts.

Empty weight: Cross EPAC/EAPC (incl. battery) ____ kg

Maximum permissible overall weight: Cross EPAC/EAPC, riders, luggage and trailer, if permitted ____ kg

Rear rack permitted ☐ yes ☐ no

Permissible load ____ kg

Child seat permitted ☐ yes ☐ no

Trailer permitted ☐ yes ☐ no

Permissible trailer load ____ kg

Brake levers – Brake assignment

Right lever: ☐ front wheel brake ☐ rear wheel brake

Left lever: ☐ front wheel brake ☐ rear wheel brake

⚠ WARNING

Read at least the chapters "Before Your First Ride", "Intended Use" and "Before Every Ride" in the translation of these original Cross operating instructions.

Stamp and signature of the Cross dealer

Speed pedelecs (a) are bicycles with an auxiliary motor which provides assistance to the rider even beyond a speed of 25 km/h to max. 45 km/h (15.5 mph to max. 28 mph), as long as you continue pedalling. Without pedalling a speed pedelec provides assistance to a maximum speed of 20 km/h (12.4 mph).

In the UK EPACs/EAPCs that can be propelled without pedalling, i.e. by a throttle alone, are also referred to as 'twist and gos'. They require type approval (if bought as of January 2016).

The legal regulations for riding a speed pedelec with regard to driving licence, registration, type approval, requirement to wear a helmet (b), insurance, regulations on the use of cycle lanes etc. are listed in the **"Overview on EPACs/EAPCs, Speed Pedelecs and 'Twist and Gos' – Legal Regulations in Great Britain"** at the end of this chapter. Speed pedelecs are considered motor vehicles and therefore subject to strict regulations relating to the replacement of components and changes.

One-way streets with signs stating it is permitted for cyclists to ride the wrong way down are not open for speed pedelec riders. Roads which are closed for motor vehicles, motor cycles and mopeds, must neither be used by speed pedelecs.

When you ride a speed pedelec in the UK, wearing a motorcycle helmet is compulsory.

Most of the speed pedelecs are designed for cycling exclusively on lanes and roads with a smooth surface. Only use trails and tracks that are open to speed pedelecs. Typical speed pedelecs are in general not suitable for off-road use. Using typical speed pedelecs off-road can result in crashes with unforeseeable consequences.

⚠ WARNING

Do not modify or manipulate ("tuning") your speed pedelec. Risk of accident! Modifications and manipulations will render the warranty void and result in a loss of the private liability insurance cover. The speed pedelecs are then possibly no longer approved for use on public roads.

SAFETY INSTRUCTIONS

The regulations and rules for EPACs/EAPCs and speed pedelecs are continuously revised. Read the daily press to keep yourself informed about current legislative changes.

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Overview on EPACs/EAPCs, Speed Pedelecs and 'Twist and Gos' – Legal Regulations in Great Britain[1]

	EPAC/EAPC (also with pushing aid)	**Speed pedelec**	**'Twist and go' EAPC**
Pedal assistance up to max. km/h (mph)	25 km/h (15.5 mph) MDS[2] without pedal assistance 6 km/h (3.7 mph)	45 km/h / 28 mph (with pedalling) 20 km/h / 12.4 mph (without pedalling) MDS[2]	Propulsion without pedalling, with throttle
Helmet	recommended	compulsory (motorcycle helmet)[3]	compulsory (motorcycle helmet)[3]
Rear-view mirror (c)	no	yes	yes
Horn	no	yes	yes
Driving licence	no	yes (cat. AM)	yes (cat. AM)
Registration or type aproval	no, however UKCA mark and UKNI mark (North Ireland) and/or CE mark (until 2024/12)[4]	yes, tax disc, number plate, MOT certificate	yes, tax disc, number plate, MOT certificate
Insurance	no	yes	yes
Riding on cycle lanes permitted	**in town:** yes **out of town:**yes	**in town:** no **out of town:** no	**in town:** no **out of town:** no
Riding on forest trails	yes	no	no
Vehicle class	bicycle	moped	moped
Legal age	14 years	16 years	16 years
Child seat	yes[5]	forbidden (d)	forbidden (d)
Child trailer	yes[5]	forbidden	forbidden

[1] In accordance with www.gov.uk/electric-bike-rules
The regulations and rules are continuously revised. Read the daily press to keep you informed about current legislative changes.

[2] MDS – maximum design speed

[3] All helmets worn must meet either the British Standard BS 66558:1985 and carry the BSI Kitemark or the UNECE Regulation 22.05

[4] UKCA (UK conformity assessed) plus UKNI where North Ireland is involved, see www.gov.uk/guidance/using-the-ukca-marking

[5] For many bike models this legal authorisation is restricted. Observe the e-MTB card.

Last update 2024/01

⚠ WARNING

Tuning, i.e. improvement in performance and speed is not a trivial offence, but has far-reaching consequences ranging from loss of insurance cover, prohibition of use on public roads and paths, to possible material failure due to overload, see "Risks related to the tuning of e-bikes 25 (15.5)/EPACs/EAPCs" in the chapter "Guidelines".

BEFORE YOUR FIRST RIDE

1. Your CROSS EPAC/EAPC is designed for a **maximum permissible overall weight** including the rider, the luggage, the CROSS EPAC/EAPC and the child seat or trailer load, if permitted. The maximum permissible overall weight is specified on the type plate on the CROSS EPAC/EAPC (a) or in the EPAC/EAPC card (b) in these operating instructions. If you are in doubt, contact your CROSS dealer.

⚠ WARNING

Strictly observe the category to which your CROSS EPAC/EAPC belongs. From the category you can conclude which grounds and riding actions are suitable for your CROSS EPAC/EAPC. The categories are described in the chapter "Intended Use" and in the EPAC/EAPC card.

Do not wear long skirts, wide trousers or ponchos and do not hang long cords, ribbons or the like on your CROSS EPAC/EAPC during the ride. There is the risk that they get caught in the wheels or in the drive system. Risk of accident!

Do not hang any bags or other heavy or big objects (such as umbrellas) to the handlebar of your CROSS EPAC/EAPC. Risk of accident!

⚠ WARNING

Be sure to use the CROSS EPAC/EAPC only for its intended purpose, as it may otherwise not withstand the loads and fail. Risk of accident!

⚠ CAUTION

The weight or the weight distribution on EPACs/EAPCs differs significantly from that on bicycles without drive system. A CROSS EPAC/EAPC is clearly heavier than a bicycle without drive system. For this reason parking, pushing, lifting and carrying the CROSS EPAC/EAPC is more difficult. Bear this in mind when loading your CROSS EPAC/EAPC into a car and unloading it or when mounting it on a bicycle carrier system (c).

NOTICE

We recommend that you take out private liability insurance. Make sure that coverage for this kind of damage is provided by your insurance. Contact your insurance company or agency.

SAFETY INSTRUCTIONS

Prior to pulling a trailer with your CROSS EPAC/EAPC or mounting a child seat (d), have a look at the EPAC/EAPC card and contact your CROSS dealer.

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EPAC/EAPC CARD

Manufacturer: Cross GT

Model

Frame no.

Drive system

☐ Front wheel motor ☐ Mid-mounted motor ☐ Rear wheel motor

Battery model

Serial no.

Voltage (Volt)

Ampere-hour (Ah)

Capacity (watt hours)

Suspension fork (manufacturer/model – serial no.)

Frame type

Frame size

Size of wheels and tires

Colour

Special features

Intended Use

Use in accordance with ☐ Category 1 ☐ Category 2 "Evernder"

The Cross EPAC/EAPC is not approved for use in competitions or as bike parts.

Empty weight Cross EPAC/EAPC (incl. battery) kg

Maximum permissible overall weight Cross EPAC/EAPC, rider, luggage and trailer, if applicable kg

Pannier rack permitted ☐ yes ☐ no

Permissible load kg

Child seat permitted ☐ yes ☐ no

Trailer permitted ☐ yes ☐ no

Permissible trailer load kg

Brake levers – Brake assignment

Right brake: ☐ front wheel brake ☐ rear wheel brake

Left brake: ☐ front wheel brake ☐ rear wheel brake

WARNING

Read and keep to the chapters "Before Your First Ride", "Intended Use" and "Before Each Ride" in the translation of the original Cross operating instructions.

Stamp and signature of the Cross dealer

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2. If you want to use your bicycle on public roads, it has to comply with the respective legal requirements, in particular as regards the **lighting**. These requirements may vary in each country. The equipment of your CROSS EPAC/EAPC is, therefore, not necessarily complete. Ask your CROSS dealer for the laws and regulations applicable in your country or in the country you intend to use the CROSS EPAC/EAPC.

   Have your CROSS EPAC/EAPC equipped accordingly, before using it on public roads (e). For more information in this regard, read the chapters **"Lighting"** and **"Legal Requirements for Riding on Public Roads"**.

3. **The rechargeable battery of your CROSS EPAC/EAPC must be charged before you set off for the first time (f-h).** Are you familiar with the handling and mounting of the rechargeable battery? Before you set off for the first time, check that the battery is properly mounted, that it has engaged audibly and that it is locked.

   For more information, read the chapter **"Safe Handling of the Rechargeable Battery"**.

⚠ WARNING

- ***We recommend that you charge your battery during the day and only in dry rooms which have a smoke or a fire detector; but keep it out of your bedroom. Place the battery during the charging process on a big, non-inflammable base e.g. made of ceramics, glass, cement or stone!***
- ***Charge your battery only with the supplied charger. Do not use the charger of any other manufacturer, not even when the connector of the charger matches your rechargeable battery. The rechargeable battery can heat up, catch fire or even explode!***
- ***Do not charge and park the CROSS EPAC/EAPC in the blazing sun. Temperatures above 40 °C (104 °F) may result in a failure of the battery.***

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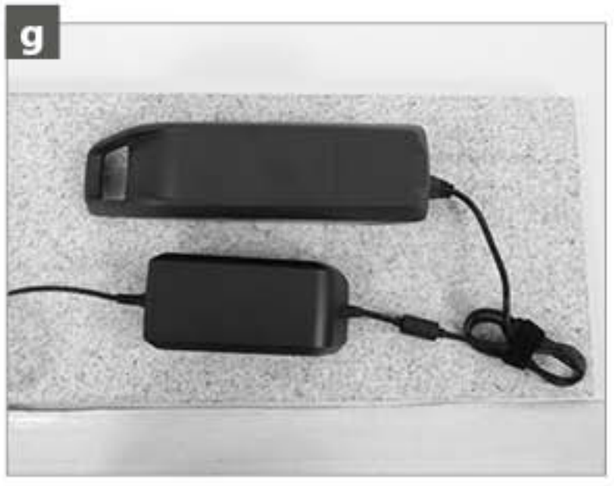

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SAFETY INSTRUCTIONS

Note that the rechargeable battery of some systems switches into the sleep mode after a few days of non-use. If you want to know how to awake the battery, you find more information in the system instructions of the drive system manufacturer, e.g. Bafang, Bosch, Brose, Fazua, Mahle, Neodrives, Panasonic, Pinion, Shimano, TQ, Yamaha. If you are not absolutely sure about the manufacturer of your drive system, contact your CROSS dealer.

4. Have you ever ridden an EPAC/EAPC? Note the particular **riding characteristics of this revolutionary hybrid drive concept** (a+b). Set off for your first ride by selecting the lowest level of drive assistance. Slowly approach the potential of your CROSS EPAC/EAPC in an area free of traffic.

   For more information in this regard, read chapter **"Useful Tips for Riding a CROSS EPAC/EAPC"**.

5. The **functions of your CROSS EPAC/EAPC** are operated with the buttons on the control element on the handlebar (c). Are you familiar with all functions and displays? Check whether you know the functions of all buttons.

   You find more information in the system instructions of the drive system manufacturer, e.g. Bafang, Bosch, Brose, Fazua, Mahle, Neodrives, Panasonic, Pinion, Shimano, TQ, Yamaha.

   If you are not absolutely sure about the manufacturer of your drive system, contact your CROSS dealer.

6. **Are you familiar with the brake system?** Have a look at the EPAC/EAPC card and check whether you can actuate the front brake with the same brake lever (right or left) you are used to. If this is not the case, have it modified by your CROSS dealer before you set off for the first time! Make sure the assignment of the brake levers to the brake is the same on all your bicycles.

   Your new CROSS EPAC/EAPC is equipped with modern brakes (d) which may be far more powerful than those you were used to so far. Be sure to first practise using the brakes on a level, non-slip surface in an area free of traffic!

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Slowly approach higher brake performances and speeds. For more information see the chapter **"Brake System"** and the possibly enclosed operating instructions.

⚠ WARNING

The brakes of your CROSS EPAC/EAPC are always more effective than the drive system. If you have problems with your drive system (e.g. because it pushes you forward in front of a bend), stop pedalling and actuate both brakes of your CROSS EPAC/EAPC carefully.

Actuate the brake lever of the rear wheel brake and stop pedalling. The CROSS EPAC/EAPC stops. Emergency stop/Emergency switching off! With a front motor, however, the front brake must be actuated carefully. The shortest possible stopping distance is achieved by braking with both brakes simultaneously and gradually.

7. **Are you familiar with the type and functioning of the gears (e+f)?** Ask your CROSS dealer to explain the gear system to you and make yourself familiar with your new gears in an area free of traffic, if necessary. For more information see the chapter **"Gears"** and the possibly enclosed operating instructions.

8. **Are both saddle and handlebar properly adjusted?** The saddle should be set to a height from which you can just reach the pedal in its lowest position with your heel (g). Check whether your toes reach to the floor when you are sitting on the saddle.

   Your CROSS dealer will be pleased to help you, if you are not happy with your seating position. For more information see the chapter **"Adjusting the CROSS EPAC/EAPC to the Rider"**.

⚠ CAUTION

Make particularly sure there is enough space between your crotch and the top tube (h) so that you do not hurt yourself, if you have to get off your CROSS EPAC/EAPC quickly.

9. **If your CROSS EPAC/EAPC is equipped with clipless or step-in pedals:** Have you ever tried the shoes they go with? Do not set off until you have practised engaging and disengaging the shoes from the pedals at standstill. Ask your CROSS dealer to explain the pedals to you. For more information see the chapter **"Pedals and Shoes"** and the possibly enclosed operating instructions.

10. **If you have bought a CROSS EPAC/EAPC** with suspension, you should ask your CROSS dealer to adjust the suspension mechanism to your needs before delivery. Improperly adjusted suspension forks or suspension elements can result in malfunction or damage to the suspension elements. In any case, the riding behaviour deteriorates and you do not achieve maximum riding safety and riding pleasure.

    For more information see the chapters **"Suspension Forks"** and **"Suspension Seat Posts"**. Further notes regarding full-suspension CROSS EPACs/EAPCs and suspension forks are possibly enclosed with this manual (a).

⚠ WARNING

- ***When getting on your CROSS EPAC/EAPC make sure not to step in the pedals until you sit in the saddle and have a firm grip on the handlebar or the pedal is at its lowest point when getting on. The motor assistance might switch on suddenly and result in an uncontrolled start of your CROSS EPAC/EAPC. Risk of accident!***

⚠ WARNING

- ***Be aware that the distance you need to stop your CROSS EPAC/EAPC may increase, when you are riding with your hands on bar ends (b). The brake levers are not in all gripping positions within easy reach.***
- ***Note that in wet conditions the braking effect and the tyre grip may decrease considerably. Look well ahead when riding on wet roads and on loose ground and ride clearly slower than you would in dry conditions.***
- ***A lack of practice when using step-in pedals (c) or too much spring tension in the mechanism can lead to a very firm connection, from which you cannot quickly step out. Risk of accident!***

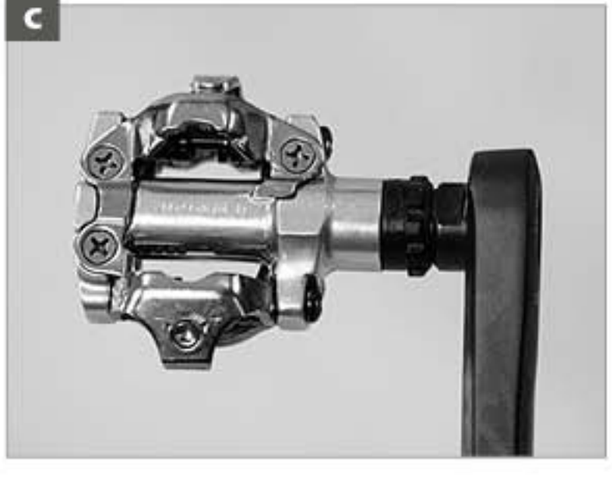
⚠ CAUTION

- ***The weight or the weight distribution on EPACs/EAPCs differs significantly from that on bicycles without drive system. A CROSS EPAC/EAPC is clearly heavier than a bicycle without drive system. For this reason parking, pushing, lifting and carrying the CROSS EPAC/EAPC is more difficult. Bear this in mind when loading your CROSS EPAC/EAPC into a car and unloading it or when mounting it on a bicycle carrier system (d).***
- ***The A-weighted emission sound pressure level at the rider's ears is less than 70 dB(A).***

a

b

c



d

NOTICE

- ***Note that not all CROSS EPACs/EAPCs are equipped with a kickstand (e). Therefore, when parking your CROSS EPAC/EAPC, make sure it stands safe and secure and is not at risk of toppling over or being knocked over. If your CROSS EPAC/EAPC topples over, it can suffer from damage. Actuate one of the brake levers and fix it with an elastic. The braking effect prevents the CROSS EPAC/EAPC from rolling away and from toppling over subsequently.***
- ***Check with your insurers that the CROSS EPAC/EAPC as well as the storekeeping and the charging of lithium-ion batteries are covered by your household and fire insurance. Read the daily press to keep yourself informed about current legislative changes.***

BEFORE EVERY RIDE

Your CROSS EPAC/EAPC has undergone numerous tests during production and a final check has been carried out by your CROSS dealer.

Nevertheless, be sure to check the following points before every ride to exclude any malfunctioning that may be due to the transport of your CROSS EPAC/EAPC or to modifications a third person may have performed on your CROSS EPAC/EAPC during a standing time:

1. Are the quick-releases (f), thru axles or the bolted connections of the front and rear wheel, the seat post and other components properly closed?

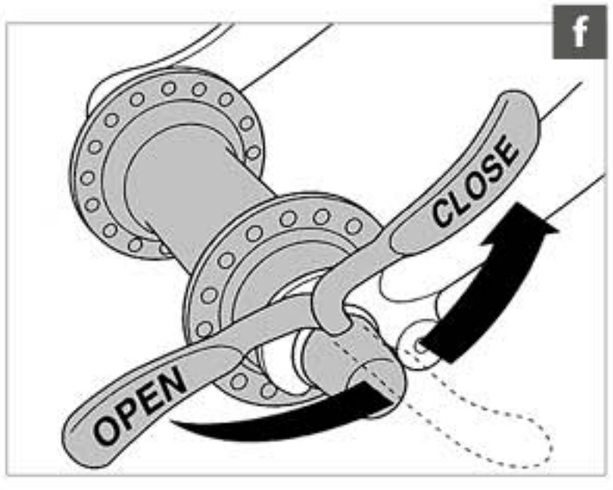
   For more information see the chapter **"How to Use Quick-Releases and Thru Axles"** and the possibly enclosed operating instructions.

⚠ CAUTION

- ***Remove, as far as possible, the rechargeable battery (g) or the display (h) before doing any work on your CROSS EPAC/EAPC (e.g. servicing, repairs, assembly, maintenance, work on your drive system, etc.). Activating the drive systems unintentionally bears the risk of injury!***

e

f



g

h

2. **Is the battery tight in its holder** (a) and properly locked up (b)? Never set off with a loose and unlocked battery.

   You find more information in the system instructions of the drive system manufacturer, e.g. Bafang, Bosch, Brose, Fazua, Mahle, Neodrives, Panasonic, Pinion, Shimano, TQ, Yamaha.

   If you are not absolutely sure about the manufacturer of your drive system, contact your CROSS dealer.

3. **Does the display of the control element and the cycle computer on the handlebar show all values** (c)? Is there any error message or warning on the display? Check the values are correct before every ride. Do not set off on your CROSS EPAC/EAPC when the control element shows a warning.

   You find more information in the system instructions of the drive system manufacturer, e.g. Bafang, Bosch, Brose, Fazua, Mahle, Neodrives, Panasonic, Pinion, Shimano, TQ, Yamaha.

   If you are not absolutely sure about the manufacturer of your drive system, contact your CROSS dealer.

4. **Are the plug connections on the rechargeable battery, on the control element on the handlebar and on the drive system** (d) **properly connected?**

   You find more information in the system instructions of the drive system manufacturer, e.g. Bafang, Bosch, Brose, Fazua, Mahle, Neodrives, Panasonic, Pinion, Shimano, TQ, Yamaha.

   If you are not absolutely sure about the manufacturer of your drive system, contact your CROSS dealer.

5. **Is your battery fully charged?** Remember to fully recharge the battery after each longer ride (e.g. less than 50 % charged). Modern lithium-ion batteries have no memory effect. However, it does not matter if your CROSS EPAC/EAPC is left as it is for a short time (e.g. overnight) when less than 50 % charged. However, you should not wait until the battery is fully discharged!

   You find more information in the system instructions of the drive system manufacturer, e.g. Bafang, Bosch, Brose, Fazua, Mahle, Neodrives, Panasonic, Pinion, Shimano, TQ, Yamaha.

   If you are not absolutely sure about the manufacturer of your drive system, contact your CROSS dealer.

a

b

c

d

6. **Are the tyres in good condition and do they have sufficient pressure (e)?** Note that a CROSS EPAC/EAPC weighs heavier and that your usual tyre pressure may be insufficient. A higher pressure gives a better riding stability and reduces the risk of a puncture. The minimum and maximum pressure (in bar or PSI) is indicated on the tyre side.

   For more information see the chapter **"Wheels and Tyre Equipment"**and the possibly enclosed operating instructions.

7. **Let both wheels rotate freely to check whether the rims run true.** If you have disc brakes, watch the gap between frame and tyre and, if you have rim brakes, between brake pad and rim. Poor concentricity can also be an indication of laterally burst tyres, broken axles or torn spokes.

   For more information see the chapter **"Wheels and Tyre Equipment"**and the possibly enclosed operating instructions.

8. **Test the brakes at standstill** by firmly pulling the brake levers towards the handlebar (f). You should not be able to pull the lever all the way to the handlebar. If you have hydraulic brakes, check the hydraulic brake hoses for oil or brake fluid leaks! Also check the thickness of the brake pads.

   With **disc brakes** you should have a stable pressure point at once. If you have to actuate the brake lever more than once to get a positive braking response, have the CROSS EPAC/EAPC checked by your CROSS dealer.

   The brake pads of **rim brakes** (g) must hit the rim evenly with their entire surface without touching the tyre during braking, in open condition or in between.

   For more information see the chapter **"Brake System"** and the possibly enclosed operating instructions.

9. **Let your CROSS EPAC/EAPC bounce on the ground from a small height (h).** If there is any rattling, check where it comes from. Check the bearings, the bolts and the proper seat of the battery, if necessary.

10. **If you want to ride on public roads,** make sure your CROSS EPAC/EAPC is equipped according to the regulations of your country (a). Riding without lights and reflectors in poor visibility and in the dark is very dangerous.

    You will be seen too late or not at all by other road users. If you ride on public roads, you always need an approved lighting system. Switch on the light as soon as it gets dark.
    For more information see the chapter **"Legal Requirements for Riding on Public Roads"**.

11. **If your CROSS EPAC/EAPC** (b) **has suspension, check it as follows:** Press down on your CROSS EPAC/EAPC and see whether the spring elements retract and extend as usual.
    For more information see the chapters **"Suspension Forks"**, and **"Suspension Seat Posts"** as well as the possibly enclosed operating instructions.

12. **If necessary, make sure the kickstand is fully raised** before you set off. **Risk of accident!**

13. **Do not forget to take a high quality folding** (c)**, D- or chain lock with you on your ride.** The only way to effectively protect your CROSS EPAC/EAPC against theft is to lock it to an immovable object.

⚠ WARNING

Improperly closed fastenings (d) ***can cause components to come loose and result in severe accidents!***

Do not use your CROSS EPAC/EAPC, if it fails on one of these points! Riding a defective CROSS EPAC/EAPC can result in serious accidents! If you are in doubt or if you have any questions, contact your CROSS dealer.

The drive system is free of vibrations. During use your CROSS EPAC/EAPC is undergoing stress resulting from the surface of the road and through the rider's action. Due to these dynamic loads, the different parts react with wear and fatigue. Check your CROSS EPAC/EAPC regularly for wear marks, scratches, deformations, colour changes and any indication of cracking. Components which have reached the end of their service life may suddenly fail. Let your CROSS dealer maintain and service your CROSS EPAC/EAPC regularly and in cases of doubt it is always best to replace components.

NOTICE

Remove, if possible, the display when parking the CROSS EPAC/EAPC. This is a first step to protect the CROSS EPAC/EAPC against theft; in addition, it cannot be used with drive system ad hoc.

a

b

c

d

AFTER AN ACCIDENT

1. **Check the rechargeable battery** (e)**.** If the rechargeable battery is no longer properly in its holder or shows any damage, do not use your CROSS EPAC/EAPC any longer, at least not in the assistance mode. Switch off the drive system and the battery separately, if necessary. A damaged battery can lead to a short-circuit resulting in a sudden failure of the CROSS EPAC/EAPC assistance right at the moment when you need it.

   If the battery housing is damaged, contact your CROSS dealer immediately. Water or moisture may enter, causing short circuits or electric shocks. The rechargeable battery may catch fire or even explode!

2. **Check the display.** Are all values displayed as usual (f)? Do not use your CROSS EPAC/EAPC, if the display shows an error message or a warning. If necessary, switch off the system and wait ten seconds at least before you check it again.

Do not set off on your CROSS EPAC/EAPC with motor assistance when the control element shows a warning. In such a case, contact your CROSS dealer immediately.

You find more information in the system instructions of the drive system manufacturer, e.g. Bafang, Bosch, Brose, Fazua, Mahle, Neodrives, Panasonic, Pinion, Shimano, TQ, Yamaha.

If you are not absolutely sure about the manufacturer of your drive system, contact your CROSS dealer.

3. **Check that the wheels are still firmly fixed in the dropouts** (g) and that the rims are still centred with respect to the frame or fork. Spin the wheels (h) and observe the gap either between frame and tyre or between brake pads and rim sides.

   If the width of the gap changes markedly and you have no way to true the wheel where you are, you will need to release the rim brake a little so that the rim can run between the brake pads without touching them. Note that in this case the brakes may not act as powerfully as you are used to.

For more information see the chapters **"How to Use Quick-Releases and Thru Axles"**, **"Brake System"**, **"Wheels and Tyre Equipment"** and the possibly enclosed operating instructions.

e

f

g

h

4. **Check that handlebar and stem are neither bent nor broken** and that they are level and upright. Make sure the stem is firmly fixed on the fork by trying to turn the handlebar relative to the front wheel (a). Briefly lean on the brake levers to make sure the handlebar is firmly fixed in the stem.

   Realign the components, if necessary, and gently tighten the bolts to ensure a reliable clamping of the components. You find the torque values on the components themselves, in the chapter **"Recommended Torque Values"** or in the possibly enclosed instructions of the component manufacturers. Alternatively, you find them in the download area on the websites of the respective component manufacturers.

   For more information see the chapters **"Adjusting the CROSS EPAC/EAPC to the Rider"**, **"Headset"** and the possibly enclosed operating instructions.

5. **Check that the chain still runs on the chainrings and the sprockets.** If your CROSS EPAC/EAPC fell over to the chain side, verify the proper functioning of the gears. Ask somebody to lift the CROSS EPAC/EAPC by the saddle and carefully shift through all the gears. Especially towards the lower gears, when the chain climbs onto the larger sprockets, you must pay attention to how far the rear derailleur approaches the spokes (b+c).

   If the rear derailleur or the dropouts/derailleur hanger are bent, the rear derailleur may collide with the spokes. This can result in damage to the rear derailleur, the rear wheel and the frame. If necessary, check the function of the front derailleur, as a displaced front derailleur can throw off the chain, thus interrupting suddenly the drive of the CROSS EPAC/EAPC.

   For more information see the chapter **"Gears"** and the possibly enclosed operating instructions.

6. Make sure the saddle is not out of alignment **using the top tube (d) or the bottom bracket shell as a reference**. If necessary, open the clamping, realign the saddle and retighten the clamping.

   For more information see the chapters **"How to Use Quick-Releases and Thru Axles"**, **"Adjusting the CROSS EPAC/EAPC to the Rider"** and the possibly enclosed operating instructions.

7. **Let your CROSS EPAC/EAPC bounce on the ground from a small height.** If there is any rattling, check where it comes from. Check the bearings, the bolts and the proper seat of the battery and the connector (e+f), if necessary. Tighten loose bolted connections slightly, if necessary.

   You find more information in the system instructions of the drive system manufacturer, e.g. Bafang, Bosch, Brose, Fazua, Mahle, Neodrives, Panasonic, Pinion, Shimano, TQ, Yamaha.

   If you are not absolutely sure about the manufacturer of your drive system, contact your CROSS dealer.

8. **Finally, look over the whole CROSS EPAC/EAPC** again to detect any deformations, colour changes or cracks (g).

Ride back very carefully by taking the shortest route possible, even if your CROSS EPAC/EAPC went through this check without any problems. Do not accelerate or brake hard and do not ride out of the saddle. If you are in doubt about the performance of your CROSS EPAC/EAPC, have yourself picked up by car, instead of taking any risk.

Back home you need to recheck your CROSS EPAC/EAPC (h) thoroughly. The damaged parts must be replaced. Ask your CROSS dealer for help.

⚠ WARNING

Deformed components can break without previous warning. They must not be repaired, i.e. straightened, as this will not reduce the imminent risk of breakage. This applies in particular to the fork, the handlebar, the stem, the cranks, the seat post and the pedals. When in doubt, it is always recommendable to have these components replaced, as your safety comes first. Ask your CROSS dealer for help.

NOTICE

After an accident or after your CROSS EPAC/EAPC has toppled over, make it a rule to check the functioning and in particular the limit stops of the rear derailleur.

e

f

g

h

USEFUL TIPS FOR RIDING A CROSS EPAC/EAPC

Your CROSS EPAC/EAPC is designed to be used like a conventional bicycle. The unique riding experience, however, only starts when you activate the drive system (a), when the powerful motor/drive unit with its high torque provides you assistance all the more the stronger you pedal yourself.

Set off for your first ride by selecting the lowest level of drive assistance. Gradually get used to the additional propulsion. Slowly approach the potential of your CROSS EPAC/EAPC in an area free of traffic. Practise typical riding situations such as starting and braking, tight corners and riding on narrow cycle paths and lanes. This is where a CROSS EPAC/EAPC clearly differs from a conventional bicycle.

⚠ WARNING

The brakes of your CROSS EPAC/EAPC are always more effective than the drive system. If you have problems with your drive system (e.g. because it pushes you forward in front of a bend), stop pedalling and actuate both brakes of your EPAC/EAPC carefully. Actuate the brake lever of the rear wheel brake and stop pedalling. The EPAC/EAPC stops. Emergency stop/Emergency switching off! With a front motor, however, the front brake must be actuated carefully. The shortest possible stopping distance is achieved by braking with both brakes simultaneously and gradually.

Riding with Drive Assistance

You can switch on and off the system at the buttons of the control element, the battery (b) or the handlebar (c). Furthermore, different assistance modes can be selected, the remaining capacity of the rechargeable battery is displayed and different functions of the cycle computer (d) can be selected, if necessary.

When switched on, the system is activated by pedalling and the drive assistance is available. Sensors measure your pedalling movements and control the fully automated drive assistance according to the selected assistance mode. The level of the additional propulsion depends on the assistance mode, your speed and possibly the amount of force applied to the pedals.

The assistance switches off when you reach a speed of more than 25 km/h (15.5 mph).

Keep in mind that you may have to change your riding habits:

Do not get on the CROSS EPAC/EAPC by placing one foot on the pedal and by trying to throw the other leg over the saddle. The CROSS EPAC/EAPC would set off suddenly. **Risk of accident!**

a

b

c

d

Stop pedalling earlier than you are used to before riding a turn or bend. Otherwise there may be too much propulsion and your cornering speed may be too high.

Do not allow yourself to always ride in a high gear, due to the powerful motor/drive unit. Shift gears frequently (e) in the same way that you are used to doing with a conventional bicycle so as to make your own contribution to your forward progress as efficient as possible. Your cadence should always be in a smooth flow. In other words, you should pedal at more than 60 crank rotations per minute. Shift down before stopping.

Keep in mind that the other road users are not yet used to the EPAC/EAPCs and their higher speeds. Ride with this fact in mind and anticipate the actions of other road users. Be aware that the speed you ride at will be clearly faster than you are used to. Therefore, keep these facts in mind and be ready to brake whenever an unclear or a possibly dangerous situation comes into your field of vision.

⚠ WARNING

- ***Do a test ride in an unfrequented area (f) to make yourself familiar with the riding characteristics of your CROSS EPAC/EAPC and the possibly higher speed and acceleration, before riding on public roads. Risk of accident! Never ride without a helmet!***

⚠ WARNING

- ***When getting on your CROSS EPAC/EAPC make sure not to step in the pedals until you sit in the saddle and have a firm grip on the handlebar or the pedal is at its lowest point when getting on. The motor assistance might switch on suddenly and result in an uncontrolled start of your CROSS EPAC/EAPC. Risk of accident!***
- ***Keep in mind that due to the higher driving power at the rear wheel (g) and in particular in the case of the much less frequently used front wheel motors the risk of an accident increases with slippery roads (due to wetness, snow, gravel etc.). This applies all the more when riding bends. Risk of accident!***
- ***Note that car drivers and other road users may underestimate your speed. Always wear bright clothing. Therefore, always ride on public roads with this fact in mind and anticipate the actions of other road users. Risk of accident!***
- ***Keep in mind that pedestrians do not hear you when you approach at high speed. Therefore, ride particularly defensive and anticipating when using cycle lanes and cycle/footpaths to avoid accidents. If necessary, ring the bell to warn others (h).***

e

f

g

h

Range – Useful Information for a Long Ride

How long and how far you can benefit from the auxiliary drive depends on several factors: i.e. the road conditions, the weight of the rider and any additional load, the rider's pedal force, the degree or mode of assistance, (head)winds, frequent stops, temperature, weather conditions, topography, tyre pressure etc.

The charge state of your rechargeable battery can be read from the display of the control element on the handlebar **(a+b)** or, additionally, on the rechargeable battery **(c)**.

You find more information in the system instructions of the drive system manufacturer, e.g. Bafang, Bosch, Brose, Fazua, Mahle, Neodrives, Panasonic, Pinion, Shimano, TQ, Yamaha.

If you are not absolutely sure about the manufacturer of your drive system, contact your CROSS dealer.

To extend the range it is recommended that you ride with low or no assistance at all on level or downhill trails and only select maximum drive assistance with headwinds, heavy additional loads and/or when climbing hills.

Furthermore, you can affect the range by

- checking the tyre pressure regularly, i.e. once a week, with a pressure gauge, and adjusting it, if necessary **(d)**
- shifting gears down in front of traffic lights and intersections or in general in cases of stops and by setting off in low gears
- shifting regularly, as you might be used to from a bicycle without drive system, i.e. by not only riding in high gears
- riding with these facts in mind and always looking ahead to avoid any unnecessary stops
- reducing your additional load, i.e. riding without unnecessary luggage
- storing your battery in your home and installing it only shortly before you set off on your CROSS EPAC/EAPC in cooler weather, in particular when it is cold
- not parking the CROSS EPAC/EAPC in the blazing sun

Some EPACs/EAPCs offer the possibility to switch downhill into the recuperation mode for energy recuperation. For more information on whether your CROSS EPAC/EAPC provides the possibility of power recuperation, read the system instructions of the drive system manufacturer. If your battery has not enough capacity to reach your destination, benefit from the decisive advantage of the hybrid concept of your CROSS EPAC/EAPC: Without drive assistance you can ride it like a conventional bicycle with an unlimited range and nearly without loss of riding characteristics.

⚠ WARNING

If your rechargeable battery runs empty during the ride, be sure to charge it only with the supplied charger (e). Do not use the charger of any other manufacturer, not even when the connector of the charger matches your rechargeable battery. The rechargeable battery can heat up, catch fire or even explode!

NOTICE

The batteries of CROSS EPACs/EAPCs have no memory effect. It is recommended that you charge the battery after every long ride. Do not park the CROSS EPAC/EAPC with a fully discharged battery. Risk of the battery's deep discharge.

Fully discharge your rechargeable battery every three month and recharge it then immediately. This calibrates the capacity indicator and restores its accuracy.

Keep in mind that the battery of your CROSS EPAC/EAPC shows signs of wear over the years. This results in a continuous reduction of the battery's capacity and in a reduced range compared to its state as new. After a certain period of time the battery even needs to be replaced.

SAFETY INSTRUCTIONS

Tips on how to exploit the battery's capacity to the maximum are given in the chapter "Safe Handling of the Rechargeable Battery".

Riding without Drive Assistance

You can also use your CROSS EPAC/EAPC without drive assistance, i.e. just like a conventional bicycle.

Observe the following points when riding with the drive system switched off or with a discharged rechargeable battery:

- Even if you want to ride without drive assistance, you can switch on the control element on the handlebar of your CROSS EPAC/EAPC to have the functions of your cycle computer available.
- If the lighting system (f) is powered by the rechargeable battery, it can even be used when the battery is empty. It is, however, recommended that you recharge the battery immediately after you have returned.
- After you have removed the battery of your CROSS EPAC/EAPC from the down tube (g) or the pannier rack: Keep the connections of the rechargeable battery (h) free of dirt and moisture. Protect the connections of your rechargeable battery with the protective covers, if supplied. With the battery removed the display and in particular the lighting system will, however, no longer work. You should no longer use the CROSS EPAC/EAPC on public roads and under no circumstances ride in poor visibility, twilight or darkness.

e

f

g

h

SAFE HANDLING OF THE RECHARGEABLE BATTERY

When you do not use your CROSS EPAC/EAPC for a longer period of time (e.g. during the winter season) observe some particularities. Store the rechargeable battery or the complete CROSS EPAC/EAPC (a) when the battery is integrated in the frame in a dry room at temperatures between 5 and 20 °C (41 and 68 °F) The state of charge should be 50 to 70 % of the charging capacity. Check the state of charge, if the rechargeable battery is left unused for more than two months, and recharge it in between, if necessary (b).

Clean the battery housing with a dry or, if at all, a slightly moist cloth (c). Look out for possible defects of the housing. Do not direct the water jet of a high-pressure cleaner at the rechargeable battery, as there is a risk of water entry and/or short-circuit. Check after every cleaning whether the area around the rechargeable battery is free of water and whether the contacts are dry.

You find more information in the system instructions of the drive system manufacturer, e.g. Bafang, Bosch, Brose, Fazua, Mahle, Neodrives, Panasonic, Pinion, Shimano, TQ, Yamaha.

If you are not absolutely sure about the manufacturer of your drive system, contact your CROSS dealer.

⚠ WARNING

- ***Charge your battery only with the supplied charger (d). Do not use the charger of any other manufacturer, not even when the connector of the charger matches your rechargeable battery. The rechargeable battery can heat up, catch fire or even explode!***
- ***Charge the battery with an ambient temperature of 15 to 25 °C (59 to 77 °F). Let hot batteries cool down beforehand. You should also let the battery warm up to room temperature before connecting it to the charger in winter or after a ride in cold weather.***

⚠ WARNING

- *We recommend that you charge your battery during the day and only in dry rooms which have a smoke or a fire detector; but keep it out of your bedroom. Place the battery during the charging process on a big, non-inflammable plate (e+f) made of ceramics, glass, cement or stone! Unplug the battery once it has been charged up.*
- *Make sure your rechargeable battery (g) is in sound condition. Do not open, disassemble or crush the battery. Risk of explosion!*
- *Do not use a rechargeable battery or a charger that is defective. If you are in doubt or if you have any questions, contact your CROSS dealer.*
- *Keep the rechargeable battery and the charger out of the reach of children!*
- *Do not charge any other electrical devices with the supplied charger of your CROSS EPAC/EAPC.*
- *Keep your battery away from fire and heat. Risk of explosion!*

⚠ WARNING

- *The individual drive components can be cleaned with a soft cloth and commercial neutral detergents or moistened with water, but do not use excessive water. The drive is not approved for steam cleaning, high-pressure cleaning (h) or cleaning with a water hose. The penetration of water into the electrics or the drive system can destroy the devices. Risk of explosion!*
- *Do not short-circuit rechargeable batteries. Store them therefore in a safe storage place and make sure there is no accidental contact with other conductive materials, e.g. metal parts, which may cause a short-circuit with each other. Do not deposit any objects in the storage area (e.g. clothes).*
- *Keep the rechargeable battery and the charger away from moisture and water during the charging process to exclude electric shocks and short circuits.*
- *Do not expose your battery or the charger to the blazing sun. Temperatures above 40 °C (104 °F) may result in a failure of the battery.*

e

f

g

h

⚠ WARNING

- *Make sure to use the battery only for the CROSS EPAC/EAPC for which it is designed.*
- *If the rechargeable battery or the charger (or parts of it) must be replaced, only use original spare parts. Contact your CROSS dealer.*

NOTICE

- *When you remove your battery from the holder for charging it (a) with your CROSS EPAC/EAPC left in the open during the charging process, you should protect the connections, e.g. with a plastic bag (b) against rain, water, moisture and dirt. If the connections of the rechargeable battery are soiled, clean them with a dry rag.*
- *Make sure not to discharge your rechargeable battery completely (also referred to as deep discharge). This occurs often when the battery has run out completely and the CROSS EPAC/EAPC was left standing for some days. Depth discharge will affect the rechargeable battery of your CROSS EPAC/EAPC permanently. A deep-discharged battery can only be recharged in exceptional cases and with special chargers. Contact your CROSS dealer.*

NOTICE

- *If possible, remove the rechargeable battery from your CROSS EPAC/EAPC if you do not use your CROSS EPAC/EAPC for a longer period of time and keep it clean and dry.*
- *Do not charge your battery over a long period of time, when you do not need it. When the battery is fully charged, remove the charger at short term.*
- *Do not dispose of your rechargeable battery in the normal household rubbish (c)! It must be disposed of according to battery disposal regulations. Therefore, sellers of new rechargeable batteries must provide collection of old batteries and appropriate disposal. If you are in doubt or if you have any questions, contact your CROSS dealer.*

SAFETY INSTRUCTIONS

- *Lithium-ion batteries do not have a memory effect; they can therefore be charged regardless of their state of charge without affecting their charging capacity.*
- *Also observe any instructions on the respective stickers on the rechargeable battery or on the charger (d).*

a

b

c

d

HOW TO USE QUICK-RELEASES AND THRU AXLES

Quick-Releases

Most CROSS EPACs/EAPCs are equipped with quick-releases to ensure fast adjusting, assembly and removal. Be sure to check whether all quick-releases are tight before you set off on your CROSS EPAC/EAPC. Quick-releases should be handled with greatest care, as they directly affect your safety.

Practise the proper use of quick-releases to avoid any accidents.

Quick-release mechanisms essentially consist of two operative elements:

1. The hand lever on one side of the hub which creates a clamping force via a cam when you close it (e).
2. The tightening nut on the other side of the hub setting the preload on the threaded rod (quick-release axle) (f).

⚠ WARNING

Make sure the levers of both wheel quick-releases are always on the opposite side of the chain drive. This will help you to avoid mounting the front wheel accidentally the wrong way round. In the case of CROSS EPACs/EAPCs with disc brakes and quick-releases having a 5 mm axle, it can be reasonable to mount the quick-release with the levers on the side of the chain drive (g). This prevents you from coming into contact with the rotor and from having your fingers burnt. If you are in doubt or if you have any questions, contact your CROSS dealer.

Never ride a bicycle without having checked first that the wheels are securely fastened! Risk of accident!

⚠ CAUTION

Do not touch the rotor directly after having stopped – you may burn your fingers! Always let the rotor cool down before opening the quick-release!

NOTICE

When you park the CROSS EPAC/EAPC, connect the wheels that are fastened with quick-releases together with the frame to an immovable object.

e

f

g

h

How to Fasten Components Securely with a Quick-Release

Open the quick-release. The marking "Open" on the lever should be visible now (h, p. 31).

Make sure the component to be fastened is in the accurate position. For more information see the chapters **"Wheels and Tyre Equipment"** and **"Adjusting the CROSS EPAC/EAPC to the Rider"**.

Move the lever back, as if to close it. Now you should be able to read "Close" on the outside of the lever. When you start closing the lever you should feel virtually no resistance with your hand until the lever is at right angle to the frame/fork (a).

Over the second half of its travel the resistance you feel should increase significantly. Towards the end of its travel you should need very much strength to close the lever. Use the ball of your thumb to push it in all the way while your fingers pull on an immovable part, such as the fork (b) or the rear stay, but not on a brake disc/rotor or spoke.

In its end position, the lever should be at right angle to the quick-release axle, i.e. it should not stick out to the side. The lever should lie close to the frame or the fork so that it does not open accidentally. Make sure, however, the lever is easy to grasp for an actually quick use.

To check whether the lever is securely locked apply pressure to the end of the hand lever and try to turn it while it is closed (c). If you can turn the lever around, open it and increase the initial tension. Screw the tightening nut on the opposite side clockwise by half a turn. Close the quick-release and check it again for tightness.

Finally, lift the wheel a few centimetres off the ground and hit the tyre from above. A securely fastened wheel remains in the axle mounts of frame or fork and will not rattle.

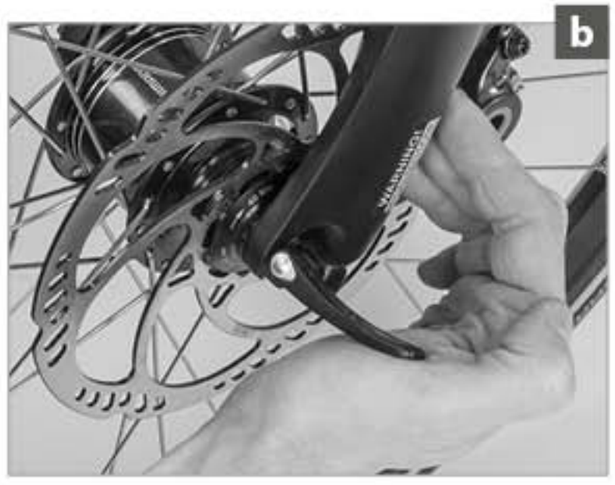
Check the quick-release of the saddle try turning it relative to the frame (d).

⚠ WARNING

With an insufficiently closed quick-release the wheel can come loose. Imminent risk of an accident!

a

b



c

d

Thru Axles

There is currently a wide range of thru-axle systems available on the market. Some systems are tightened with quick-releases (e). Other systems require special tools for assembly or disassembly.

Whatever system you use, make sure during the assembly that the thru axles, the dropouts in forks and hubs are clean. Clean the components with an absorbent cloth, if necessary, by using water and a little detergent. In case you do not succeed in adjusting and fixing the wheel, as described, contact your CROSS dealer.

Exemplary Description of Wheel Mounting with Frequent Thru-Axle Systems

Mount the front wheel into the fork and insert the brake disc/rotor into the brake calliper at the same time. Align the front wheel between the dropouts and slide the axle with the quick-release lever open from the left side through the dropout and the hub (f).

When the axle thread engages with the thread of the right fork leg, turn the axle clockwise (g). During the first turns the thru axle should be able to turn easily. Tighten the axle a little and then release it by about a third of a turn.

Close the quick-release lever like a usual quick-release lever. When you start closing the lever you should feel virtually no resistance with your hand, during the second half of the way the resistance you feel should increase significantly. Towards the end moving the lever must be very difficult.

In case you do not succeed in closing the lever fully, re-open it and turn the axle a little anticlockwise. Try again to close the quick-release lever. Use the palm of your hand while your fingers pull on the fork leg (h), but never on a spoke or the rotor. In its end position the quick-release lever should be tight so that it can no longer be turned. Make sure the quick-release lever does not stand out to the front or to the side. The best closing position is in nearly upright position in front of the lower leg.

Exemplary Description of Wheel Removal with Frequent Thru-Axle Systems

Open the quick-release lever completely. Screw open the thru axle anticlockwise.

When the thru-axle thread no longer engages with the thread of the lower leg, you can remove the thru axle fully.

Wheel Mounting with SR SUNTOUR Q-LOC2 (a)

Mount the front wheel into the fork and insert the brake disc/rotor, if available, into the brake calliper at the same time. Align the front wheel between the dropouts. Open the quick-release lever of the thru axle completely. Turn the fixing nut on the thru axle anticlockwise until the locking mechanism opens.

Slide the axle with the opened quick-release lever and loosened locking mechanism from the left (b) through the dropout and the hub until the thru axle audibly latches with an audible click.
Now turn the quick-release lever clockwise as tight as you can with your hand.

Finish by closing the quick-release lever like a usual quick-release lever (c). The quick-release lever must not stand out to the front or to the side (d). The best closing position is in nearly upright position in front of the lower leg.

Wheel Removal with SR SUNTOUR Q-LOC2

If you have an SR SUNTOUR Q-LOC system open the quick-release completely. Apply a little pressure on the fixing nut and turn the nut anticlockwise until the locking mechanism opens. When the thru-axle thread no longer engages with the thread of the lower leg, you can remove the thru axle fully.

⚠ WARNING

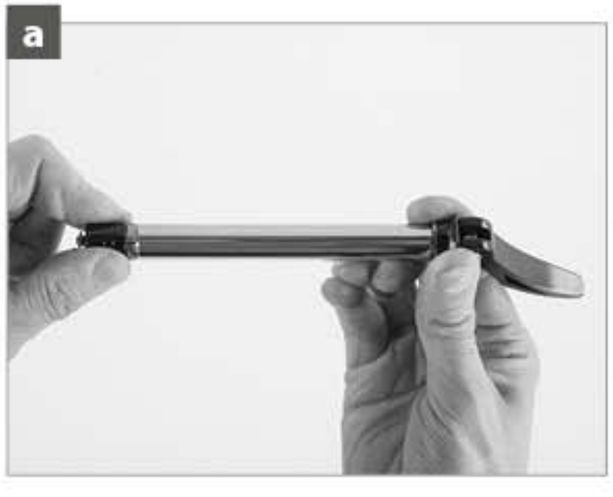
Improperly mounted wheels may throw you off your bicycle or result in serious accidents!

After the wheel mounting do a brake test in standing. You should reach the pressure point of the brake before the brake lever reaches the handlebar. In the case of hydraulic brakes pump them, if necessary, until you reach a precise pressure point. Check it by compressing the suspension fork several times.

To mount the axle only use the tools recommended by the manufacturer. Always use a torque wrench. Never exceed the maximum torque value indicated by the manufacturer! Overtightening of the axle can damage the axle or the fork leg.

SAFETY INSTRUCTIONS

The manufacturers of thru-axle systems usually make available detailed operating instructions. Read them carefully before removing the wheel or doing any maintenance work. More information is e.g. available at:
https://si.shimano.com
https://bike.shimano.com – Shimano E-Thru
www.ridefox.com www.rockshox.com www.srsuntour.com



ADJUSTING THE CROSS EPAC/EAPC TO THE RIDER

Your body height and proportions are decisive for the frame size of your CROSS EPAC/EAPC. In particular, make sure there is enough clearance between crotch and top tube to so you cannot hurt yourself when you have to get off quickly (e).

By choosing a specific type of bicycle you roughly determine the posture you will be riding in (f). However, some components of your CROSS EPAC/EAPC are especially designed so that you can adjust them to your body proportions up to a certain degree. This includes the seat post, the stem (g) and the brake levers.

As all works require know-how, experience, appropriate tools and a certain amount of skill, you should restrict yourself to adjusting the seating position. Ask your CROSS dealer for the correct seating position or if you want something changed. He will see to your wishes the next time you leave your CROSS EPAC/EAPC at the workshop, e.g. for the first inspection.

If sitting on the saddle causes you trouble, e.g. because it numbs your crotch, this may be due to the saddle. Your CROSS dealer has a very wide range of saddles available, and can offer advice on position (h).

After any adjustment/assembly work, be sure to make a short functional check as described in the chapter **"Before Every Ride"** and do a test ride on your CROSS EPAC/EAPC in an area free of traffic.

⚠ WARNING

- ***In case of very small frame sizes, there is the risk of the foot colliding with the front wheel. Therefore, make sure the cleats of your clipless pedals are properly adjusted.***
- ***All tasks described in the following require the know-how of a mechanic and appropriate tools. Make it a rule to tighten the bolted connections always with greatest attention. Increase the torque values bit by bit and check the fit of the component in between. Use a torque wrench and never exceed the maximum torque values! You find the torque values on the components themselves, in the chapter "Recommended Torque Values" or in the possibly enclosed instructions of the component manufacturers. Alternatively, you find them in the download area on the websites of the respective component manufacturers.***

e

f

g

h

Adjusting the Height of the Saddle

The correct saddle height for almost all bicycle types is the height which gives maximum pedalling comfort and efficiency. During pedalling the ball of your foot should be positioned above the centre of the pedal axle. With your feet in this position your leg should not be fully extended at the lowest point, otherwise your pedalling will become awkward.

Check the height of your saddle with flat-soled shoes. This is best done with suitable cycling shoes.

Sit on the saddle and put your heel on the pedal at its lowest point (a). Your leg should be fully extended and your hips should remain horizontal.

To adjust the saddle height loosen the quick-release (see the chapter **"How to Use Quick-Releases and Thru Axles"**) or the binder bolt of the seat post clamp (b) at the top of the seat tube.

The latter requires suitable tools, e.g. an Allen key, with which you turn the bolt two to three turns anticlockwise. Now you can perform the vertical adjustment of the seat post.

Be sure not to pull out the seat post too far. The mark on the seat post (c) (min. insert, minimum, maximum, stop or the like) should always remain within the seat tube. Always grease the surface of an aluminium or titanium seat post that is inserted into a seat tube made of aluminium, titanium or steel.

Do **not grease carbon seat posts** and/or **carbon seat tubes** in the clamping area! Use special **carbon assembly paste** instead.

Align the saddle with the frame by using the saddle nose and the bottom bracket or top tube as a reference point.

Clamp the seat post. Close the quick-release (d), as described in the chapter **"How to Use Quick-Releases and Thru Axles"** or tighten the seat post binder bolt clockwise in half turns. You should not need much strength in your hands to clamp the seat post sufficiently tight. Otherwise the seat post does not match the frame.

a

b

c

d

Check in between that the seat post is sufficiently tight by taking hold of the saddle at both ends and then trying to rotate the seat post inside the seat tube (e). If it does rotate, gently retighten the clamp bolt by half a turn and do the check again.

Does the leg extension test now produce the correct result? Check by moving your foot and pedal to the lowest point. When the ball of your foot is in the middle of the pedal in the ideal pedalling position, your knee should be slightly bent. If it is, you have adjusted the saddle height correctly.

Check whether you can touch the ground safely while sitting on the saddle by stretching your feet to the floor (f). If you cannot, you should lower the saddle a little, at least to begin with.

⚠ WARNING

Never ride with the seat post drawn out beyond the limit, maximum, or stop mark! The seat post might break or cause severe damage to the frame. If the seat post and the frame require different minimum insertion depths, you should opt for the deeper insertion depth.

⚠ WARNING

Never apply grease to the seat tube of a frame made of carbon, unless an aluminium sleeve is inside the frame. If you mount a carbon seat post, do not even grease a frame made of metal. Once greased, carbon components may never be clamped reliably again under certain circumstances! Use special carbon assembly paste instead (g).

⚠ CAUTION

Tighten carefully by approaching the prescribed maximum torque value in small steps (0.5 Nm increments) (h) and check in between the proper fit of the component. Do not exceed the maximum torque value indicated by the manufacturer! You find the torque values on the components themselves, in the chapter "Recommended Torque Values" or in the possibly enclosed instructions of the component manufacturers. Alternatively, you find them in the download area on the websites of the respective component manufacturers.

NOTICE

If the seat post does not move easily inside the seat tube or if it cannot be tightened sufficiently, ask your CROSS dealer for advice! Do not use brute force!

e

f

g

h

Adjusting the Height of the Handlebar

The height of the handlebar compared to the saddle and the distance between saddle and handlebar determines how much your upper body is inclined forward. Lowering the handlebar gives you a streamlined position and brings more weight to bear on the front wheel. However, it also entails an extremely forward leaning posture which is tiring and less comfortable, because it increases the strain on your wrists, arms, back, upper body and neck.

There are three different stem systems that allow vertical adjustment of the handlebar, i.e. The **conventional, the adjustable and the Ahead®-stem**.

These systems require special knowledge. In this regard, the descriptions hereafter may be incomplete.

If you are in doubt or if you have any questions, contact your CROSS dealer.

⚠ WARNING

- ***The stem is one of the load bearing parts of your bicycle. Changes to it can impair your safety. If you are in doubt or if you have any questions, contact your CROSS dealer!***
- ***Stems are available in different lengths*** (a) ***shaft and binder tube diameters. A stem of inappropriate dimension can become a source of danger: handlebar or stems can break, resulting in an accident. When replacing any parts, be sure to only use suitable original spare parts that bear the appropriate mark. Your CROSS dealer will be pleased to help you.***
- ***The bolted connections of the stem and the handlebar have to be tightened to the prescribed torque values*** (b)***. Otherwise the handlebar or the stem may come loose or break. Use a torque wrench*** (c) ***and never exceed the maximum torque values! You find the torque values on the components themselves*** (d)***, in the chapter "Recommended Torque Values" or in the possibly enclosed instructions of the component manufacturers. Alternatively, you find them in the download area on the websites of the respective component manufacturers.***

a

b

c

d

Conventional Stems

Handlebars with conventional stems allow limited vertical adjustment. This is done by moving the stem up or down inside the fork steerer tube.

Release the expander bolt by two to three complete turns. The stem should now turn freely inside the fork. If it does not, release the bolt by tapping it gently with a rubber hammer (e). With Allen bolts, you need to stick the Allen key into its head first, as it is normally countersunk and therefore impossible to be hit directly.

Now you can move the handlebar/stem-unit up and down as a whole. Be sure not to pull out the stem too far. The mark on the stem (end, min, max, stop, limit or the like) should always remain within the tube (f). Setting the stem to a lower position can only add to your safety!

Align the handlebar so that it is not at an angle when you ride straight ahead (g). Retighten the expander bolt with a torque wrench.

Make sure the stem is firmly fixed by taking the front wheel between your legs and trying to turn the handlebar and stem relative to the wheel (h). If there is movement, you have to increase the torque value.

Tighten carefully by approaching the prescribed maximum torque value in small steps (0.5 Nm increments) and check in between the proper fit of the component. Do not exceed the maximum torque value indicated by the manufacturer! You find the torque values on the components themselves, in the chapter **"Recommended Torque Values"** or in the possibly enclosed instructions of the component manufacturers. Alternatively, you find them in the download area on the websites of the respective component manufacturers.

If the handlebar is still too high or too low, you can replace the stem. This can be quite a big job, as it may mean taking off and remounting the entire handlebar equipment. Inform yourself at your CROSS dealer about the various stem types available.

⚠ WARNING

Never ride a bicycle with a stem that has been drawn out beyond the mark for the maximum permissible height! Check all bolted connections and test your brakes before you set off!

NOTICE

Never try to unscrew the top race of the headset when you only want to adjust the stem, as you will otherwise alter the bearing play.

e

f

g

h

Adjustable Stems

There are various solutions for adjusting the tilt of the front part of adjustable stems (a):

Some designs use bolts on the sides of the joint (b), others have bolts coming from above or below (c), and others again are equipped with additional locking mechanisms or adjusting bolts.

Before adjusting read the possibly enclosed operating instructions of the stem manufacturer. Ask your CROSS dealer to explain you both function and adjustment of your stem or let him do that work.

⚠ WARNING

Note that the bolted connections of adjustable stems and handlebar have to be tightened to the specified torque values. Otherwise the handlebar or stem may come loose or break. Use a torque wrench (d) and observe the minimum and maximum torque values! You find the torque values on the components themselves, in the chapter "Recommended Torque Values" or in the possibly enclosed instructions of the component manufacturers. Alternatively, you find them in the download area on the websites of the respective component manufacturers.

SAFETY INSTRUCTIONS

Keep in mind that readjusting the position of the stem changes the position of handlebar, brake levers and shifters. Readjust these components, as described in the chapter "Adjusting the Tilt of the Handlebar, Bar Ends and Brake Levers".

a

b

c

d

Stems for Threadless Systems, the Aheadset®-System

(Aheadset® is a registered trade mark of Dia-Compe)

In the case of bicycles with Aheadset® the stem also serves to adjust the bearing preload. If you change the position of the stem you have to readjust the bearing play (see chapter **"Headset"**). You can adjust the height to a limited extent by moving the spacers or by turning the stem around in the case of so-called flip-flop models.

Unscrew the preload bolt at the top of the fork steerer tube, remove the Ahead cap and release the bolts on either side of the stem by up to three turns (e). Remove the stem and the spacers from the fork steerer tube. In doing so keep hold of both frame and fork to prevent the fork from slipping off the head tube.

You can determine the handlebar height by the arrangement of stem and spacers (f). Slip the remaining spacers onto the fork steerer tube above the stem. Adjust the headset, as described in the chapter **"Headset"**.

If you want to turn the stem around, you have to also release the bolts of the faceplate securing the handlebar (g). If the stem has a faceplate, you can simply remove the handlebar. If it has no faceplate, you have to remove the handlebar equipment.

Mount the handlebar and, if necessary, the handlebar equipment, as described in the chapter **"Adjusting the Tilt of the Handlebar, Bar Ends and Brake Levers"** and/or in the manuals of the component manufacturers.

Check the secure fit of the handlebar in the stem by trying to rotate the handlebar downwards. Verify whether the handlebar/stem-combination can be turned relative to the fork. Do this by taking the front wheel between your knees and trying to turn the handlebar (h). If there is movement, carefully tighten the bolts a little more and check the proper fit again.

Tighten carefully by approaching the prescribed maximum torque value in small steps (0.5 Nm increments) and check in between the proper fit of the component. Do not exceed the maximum torque value indicated by the manufacturer! You find the torque values on the components themselves, in the chapter **"Recommended Torque Values"** or in the possibly enclosed instructions of the component manufacturers. Alternatively, you find them in the download area on the websites of the respective component manufacturers.

If you want your handlebar in a higher position, you may opt for a riser bar model which has an upward bend. Ask your CROSS dealer for advice.

⚠ WARNING

With a stem, the cables may be too short. Riding with too short cables is dangerous. Ask your CROSS dealer for help.

These works require a certain amount of manual skill and (special) tools This job is best left to your CROSS dealer. If you nevertheless want to try it by yourself, read the operating instructions of the stem manufacturer carefully before you start.

NOTICE

If spacers are removed, the fork steerer tube must be shortened. This procedure is irreversible. The shortening should by carried out by you CROSS dealer, but only after you have found your preferred position.

Adjusting the Tilt of the Handlebar, Bar Ends and Brake Levers

The handlebars of CROSS EPACs/EAPCs are usually slightly bent at the ends. Set the handlebar to a position in which your wrists are relaxed and not turned too much outwards.

To adjust the angle of the handlebar, release the Allen bolt(s) on the underside or front side of the stem. Turn the handlebar to the desired position. Make sure the handlebar is accurately centred in the stem (a). Carefully retighten the bolt(s) in a cross pattern by using the torque wrench until they lightly hold the handlebar in place (b). Make sure the upper and lower clamping slots of the stem are parallel and identical in width (c). Tighten the bolt(s) evenly in a cross pattern by using a torque wrench and observe the recommended torque values.

Once clamped in the stem try rotating the handlebar and tighten the bolt a little more, if necessary. Use a torque wrench and do not exceed the maximum torque values! You find the torque values on the components themselves, in the chapter **"Recommended Torque Values"** or in the possibly enclosed instructions of the component manufacturers. Alternatively, you find them in the download area on the websites of the respective component manufacturers.

a

b

c

d

After adjusting the handlebar you have to adjust the brake lever/shifter units (d).

Release the Allen bolt at either brake lever unit. Turn the levers on the handlebar. Sit in the saddle and place your fingers on the brake levers. Check whether the back of your hand forms a straight line with the line of your forearm (e). Retighten the bolts of the units with a torque wrench and do a twist test (f)!

Bar ends (g) provide additional ways of gripping the handlebar. They are usually fixed in a position that gives the rider a comfortable grip when pedalling out of the saddle. The bar ends are then almost parallel to the ground or tilted slightly upwards (by about 25°).

If you intend to mount bar ends to a handlebar, verify first that the handlebars are suitable and approved for the mounting of the bar ends. Some handlebars must be equipped with specific reinforcing sleeves (handlebar plugs). If you are in doubt or if you have any questions, contact your CROSS dealer.

Release the bolts, which are usually located on the underside of the bar ends, by one to two complete turns. Turn the bar ends to the desired position making sure the angle is the same on both sides. Retighten the bolts to the required torque value (h). Check that the bar ends are firmly fixed by trying to turn them out of position.

⚠ WARNING

- ***Note that the bolted connections of the stem, the handlebar, the bar ends and the brakes have to be tightened to the prescribed torque values. Use a torque wrench and do not exceed the maximum torque values! You find the torque values on the components themselves, in the chapter "Recommended Torque Values" or in the possibly enclosed instructions of the component manufacturers. Alternatively, you find them in the download area on the websites of the respective component manufacturers.***
- ***Never fix bar ends in vertical position or with their ends pointing rearwards as this would increase the risk of injury in the event of a fall.***
- ***Be aware that the distance you need to stop increases, when you are riding with your hands on bar ends. The brake levers are not in all gripping positions within easy reach.***

Adjusting the Brake Lever Reach

With most brake systems the distance between the brake levers and the handlebar grips (a) is adjustable. This gives in particular riders with small hands the convenience of bringing the brake levers closer to the handlebar. At least, the first knuckle of middle and index fingers should be able to grip around the lever (b).

In the case of **mechanical brakes** there is usually a small adjusting screw near the point where the brake cable of a cable brake enters the brake lever unit or at the lever itself. Turn the bolt clockwise and watch, whether and how the lever adjusts as you do so.

Hydraulic brakes also have adjusting devices at the brake lever (c). There are different systems. Ask your CROSS dealer for help or read the possibly enclosed user manual.

When adjusting the lever reach, make sure that at least the first knuckle of the middle or index finger reaches around the brake lever. Check the proper adjustment and functioning of the brake system (d) subsequently, as described in the chapter **"Brake System"** and/or in the brake manufacturer's instructions. Some brake models allow the adjusting of the lever distance and the pressure point.

⚠ WARNING

After the adjusting do a test ride in a place free of traffic or in an unfrequented place.

Make sure you cannot pull the brake levers all the way to the handlebar. Your maximum brake force should be reached before.

SAFETY INSTRUCTIONS

If you have hydraulic brakes and disc brakes, follow the instructions of the possibly enclosed brake manufacturer. If you are in doubt or if you have any questions, contact your CROSS dealer.

a

b

c

d

Correcting the Fore-to-Aft Position and Tilt of the Saddle

The position of the saddle is essential for your ride and for painless riding.

The distance between the handlebar grips and the saddle has an effect on the inclination of your upper body (e) and hence on your riding comfort and riding dynamics. This distance can be modified to a small extent by changing the position of the saddle rails in the seat post. However, moving the saddle rails in the seat post also influences pedalling. The rider pedals more or less from the back.

If the saddle is not in horizontal position, the rider cannot pedal in a relaxed manner. He must constantly support himself or hold on the handlebar to avoid sliding off the saddle.

Make sure that the upper edge of the saddle remains horizontal (f) as you retighten the bolt(s). The CROSS EPAC/EAPC should stand on level ground while you adjust the saddle.

With full suspension CROSS EPACs/EAPCs it can be advantageous to lower the saddle nose, i.e. to tilt it slightly.

The adjustment range of the saddle is very small. With adjustable stems or stems at different lengths you can realise more important adjustments in length. In parts, you can realise a difference of more than 10 cm. In most of the cases you also have to adjust the Bowden and brake cables; a job best left to your CROSS dealer!

After the mounting check whether the re-tightened saddle tilts (g) or can be twisted (h) when you alternately apply load with your hands on the nose and the end of the saddle.

⚠ WARNING

There bolts of the saddle clamp are among the most sensitive ones on the entire CROSS EPAC/EAPC. Therefore, make absolutely sure that you do not fall below the recommended minimum torque value and do not exceed the recommended maximum torque value and always use a torque wrench.
You find the torque values on the components themselves, in the chapter "Recommended Torque Values" or in the possibly enclosed instructions of the component manufacturers. Alternatively, you find them in the download area on the websites of the respective component manufacturers.

e

f

g

h

⚠ WARNING

- *Make sure the saddle rails are only clamped within the range of the marking (a). Otherwise the saddle rails can fail!*
- *If the saddle rails do not fit, do not try to force them into the clamp grooves of the seat post. The clamp device or the saddle rails could break. Use another saddle model instead or ask your CROSS dealer.*
- *Poorly tightened or loosening bolts can fail. Check the bolts once a month by using a torque wrench (b) according to the values indicated on the components themselves (c), in the chapter "Recommended Torque Values" or in the possibly enclosed instructions of the component manufacturers.*

SAFETY INSTRUCTIONS

- *The saddle and/or seat post manufacturers possibly supply their products with detailed instructions. Read them carefully before adjusting the position of your saddle. If you are not absolutely sure or have any questions, contact your CROSS dealer.*

a

b

c

Patent Clamp with one or two Parallel Bolts

In the case of patent seat posts one (e) or two (f) central Allen bolts hold the head that fixes both the tilt and the horizontal position of the saddle. Most seat posts have two bolts side by side.

To adjust the saddle position undo the bolt (g) or the bolts (h) at the seat post head. To do so loosen both bolt(s) two to three turns at the most, otherwise there is a risk that the entire mechanism will fall apart. Move the saddle horizontally to adjust the fore-to-aft position. Often you have to give the saddle a light tap to move it. Observe the marking on the saddle rails and do not go beyond (i+k).

After you have found the desired position, check that both halves of the clamp mechanism fit snugly around the saddle rails.

Make sure that the saddle or the clamp mechanism engages in one of the serrations on the seat post head while you start to tighten. Tighten the bolt(s) step by step.

If everything fits turn the bolt (l) or the bolts (m) by using a torque wrench according to the instructions of the manufacturer.

SAFETY INSTRUCTIONS

Also read the general part at the beginning of the chapter.

e

f

g

h

i

k

l

m

Yoke Clamp with two Bolts in Line

In the case of seat posts with yoke clamp (a) two vertical Allen bolts hold the head that fixes both the tilt as well as the horizontal position of the saddle. One bolt is behind the seat post, another one in front of it or in the centre (b) of the seat post.

To adjust the saddle position undo both bolts two to three turns at the most (c+d), otherwise there is a risk that the entire mechanism will fall apart. Move the saddle horizontally to adjust the fore-to-aft position. Often you have to give the saddle a light tap to move it. Observe the marking on the saddle rails (e) and do not go beyond. After you have found the desired position, check that both halves of the clamp mechanism fit snugly around the saddle rails.

Tighten both bolts evenly so that the saddle remains at the same angle. If you wish to lower the saddle nose a little, turn the front bolt clockwise. If necessary, you even have to loosen the rear bolt a little. To lower the rear part of the saddle, the rear bolt has to be turned clockwise and the front bolt to be loosened, if necessary.

If everything fits turn the bolts by using a torque wrench according to the instructions of the manufacturers (f+g).

SAFETY INSTRUCTIONS

Also read the general part at the beginning of the chapter.

a

b

c

d

e

f

g

Candle Seat Post with Separate Saddle Clamp

In the case of candle seat posts a bracket with horizontal bolt and two nuts hold the head (h+i) that fixes both the tilt and the horizontal position of the saddle.

To adjust the saddle position undo the nut(s) of the saddle clamp at the top of the seat post one to two turns at the most (k), by using an open-end spanner, otherwise the entire mechanism will fall apart.

Move the saddle horizontally to adjust the fore-to-aft position. Often you have to give the saddle a light tap to move it. Observe the marking on the saddle rails and do not go beyond. Bring the saddle now in the desired position. Tighten the nuts(s) step by step.

Make sure that the saddle engages in one of the serrations in the saddle clamp while you are tightening. Try tilting the saddle a little, then you will notice whether the mechanism is engaged. Also check that the saddle is still aligned in direction of motion. Look from behind and make sure that the saddle is in line with the frame and the front wheel. If this is the case tighten the nut(s) step by step.

If everything fits tighten the nut(s) by using a torque wrench according to the instructions of the manufacturers (l).

SAFETY INSTRUCTIONS

Also read the general part at the beginning of the chapter.

h

i

k

l

BRAKE SYSTEM

General Information on Brakes

Brakes (a-c) are used for adjusting one's speed to the surrounding terrain and traffic. When necessary, the brakes must be able to bring the CROSS EPAC/EAPC to a standstill as quickly as possible.

During such an emergency braking, the rider's weight shifts forward abruptly, thus reducing the load on the rear wheel. Therefore, it is more likely that the rear wheel will come up and the CROSS EPAC/EAPC will roll over on a slippery surface than that the tyres will lose grip. This problem becomes particularly acute when riding downhill. Therefore, in case of an emergency braking situation you must try to put your weight back and down as far as possible.

Actuate both brakes at the same time and bear in mind that the front brake can transmit far greater forces on a surface with good grip due to the shifting weight.

The braking conditions on unpaved surfaces differ, There, overbraking the front wheel can make the wheel slip away. Therefore, be sure to practise braking on different surfaces.

Wet weather reduces the braking power. Actuate the brakes carefully when riding on wet or slippery ground, as the tyres can easily slip away. Therefore, reduce your speed.

There are various types of brake systems that may be subject to the following problems:

Rim brakes (d+e) are liable to overheating as a result of too long braking or brake dragging on a longer downhill ride. This can damage the inner tube or make the tyre slip on the rim causing a sudden loss of air which could lead to a serious accident in the process.

Rims also wear down over time. They are even likely to burst. Therefore, they have to be replaced from time to time.

With **roller, drum, back-pedal and disc brakes** (f) prolonged braking or permanent dragging of brake pads can lead to an overheating of the brake system. This can result in a reduction of the brake force or even lead to brake failure. **Risk of accident!**

When riding downhill, get used to braking hard and releasing both brakes again, whenever the road surface and the situation allow for it. If in doubt, stop and let the brake system cool down.

⚠ WARNING

- ***The assignment of the brake levers to the front and rear brake can vary, e.g. left lever acts on front brake. Have a look at the EPAC/EAPC card and check whether you can actuate the front brake with the same brake lever (right or left) you are used to. If this is not the case, ask your CROSS dealer to change the brake levers before you set off for the first time. Make sure the assignment of the brake levers to the brake is the same on all your bicycles.***
- ***Get used to your brakes carefully. Practise emergency stops in a place free of traffic until you are comfortable controlling your CROSS EPAC/EAPC. This can save you from having accidents.***
- ***Wet weather reduces the braking effect and makes the tyres slip easily. Be aware of longer stopping distances when riding in the rain, reduce your speed and actuate the brakes carefully.***
- ***Make sure that braking surfaces and brake pads are absolutely free of wax, grease and oil. Risk of accident!***

SAFETY INSTRUCTIONS

- ***When replacing any parts be sure to only use parts that bear the appropriate mark and, to be on the safe side, original spare parts*** (g+h)***. Your CROSS dealer will be pleased to help you.***

e

f

g

h

Rim Brakes

V-Brakes

Operation and Wear

V-brake (a) designs have two brake arms mounted separately on either side of the rim. When actuating the brake lever, both arms are pressed together by the cable, the pads touching the rim.

The friction generated by braking causes wear to the brake pads as well as to the rims. Frequent rides in the rain and dirt and over hilly terrain can accelerate wear on both braking surfaces. Some rims are provided with wear indicators, e.g. grooves or circular indentations. If the rim is worn down to the point where the grooves or indentations are no longer visible, they need to be replaced. Once the abrasion of the rim has reached a certain critical point, the rim may break under the tyre pressure. This can make the wheel jam or the inner tube burst. **Risk of accident!**

Functional Check

Check whether the brake pads (b) are accurately aligned with the rims and still sufficiently thick. You can judge the wear of the brake pads by the appearance of grooves.

If the pads are worn down to the bottom of the grooves (c), it is time to replace them. Be sure to observe the according instructions of the respective manufacturers.

See your CROSS dealer and ask them to examine the remaining thickness of the rims when you have worn through your second set of brake pads at the latest. Your CROSS dealer has special measuring devices for determining the remaining thickness of the rims (d).

The brake pads must hit the rim simultaneously, first touching it with the front portion of their surface. At the moment of first contact the rear part of the pads should be a millimetre away from the braking surface. Viewed from the top the brake pads form a "V" with the trough pointing to the front. This setting is to prevent the brake pads from screeching when applied.

The brake lever must always remain clear of the handlebar. You should not even be able to pull them all the way to the handlebar in the event of an emergency braking. If this is the case, however, observe the following chapter **"Synchronising and Readjusting"**.

Only a successful passing of all these test points will ensure a correctly adjusted brake.

⚠ WARNING

- ***Brake cables which are damaged, e.g. frayed (e), must be replaced immediately, as they can otherwise fail in a critical moment, possibly causing a fall!***
- ***Adjusting the position of the brake pads relative to the rims requires a considerable degree of skill. Replacing and adjusting the brake pads is a job best left to your CROSS dealer.***
- ***Have your rims regularly inspected and measured by the CROSS dealer.***

Synchronising and Readjusting

Almost all brake designs have a bolt located next to one or both brake callipers for adjusting the spring preload (f). Turn the bolt slowly and watch how the gap changes between brake pads and rim.

Adjust the spring in a way that with an unapplied brake the gaps are equal on either side and the brake pads touch the rim simultaneously during braking.

The position of the brake lever where the brake starts to act, also referred to as pressure point, can be adjusted to the size of the hand as well as to individual convenience by readjusting the brake cable. Make absolutely sure you cannot pull the brake lever all the way to the handlebar grip. With an unapplied brake the brake pads should not be too close to the rim sides, otherwise they could drag along the rim during riding. Before making this adjustment, observe the notes in the chapter **"Adjusting the Brake Lever Reach"**.

To readjust the brakes, unscrew the knurled lock ring located at the point where the brake cable enters the brake lever on the handlebar (g). Unscrew the knurled, slotted adjusting bolt by a few turns. This reduces the free travel of the brake lever. Keeping the adjusting bolt firm, tighten the lock ring against the brake lever unit. This prevents the adjusting bolt from coming loose by itself. Ensure that the slot of the bolt faces neither forward nor upward, as this would permit water or dirt to enter more easily.

⚠ WARNING

- ***Test the brakes' function in standing after adjusting them (h), making sure the brake pads engage fully with the rim side when you pull them hard.***

e

f

g

h

Hydraulic Rim Brakes

Operation and Wear

Common hydraulic rim brakes **(a+b)** consist of two brake assemblies that are mounted on the left and right side of the rim and connected by an assembly plate and, if necessary by a brake booster. Actuating the brake lever compresses the hydraulic pistons through oil pressure, pushing the brake pads against the rims.

The friction generated by braking causes wear to the brake pads **(c)** as well as to the rims. Frequent rides in the rain and dirt and over hilly terrain can accelerate wear on both braking surfaces. Some rims are provided with wear indicators, e.g. grooves or circular indentations. If the rim is worn down to the point where the grooves or indentations are no longer visible, they need to be replaced. Once the abrasion of the rim has reached a certain critical point, the rim may break under the tyre pressure. This can make the wheel jam or the inner tube burst. **Risk of accident!**

Keep the hydraulic brake assemblies, especially the brake pad area, clean **(d)**, as dirt can prevent the pads from travelling back in their rest position. Regularly check the hoses and connections for leaks.

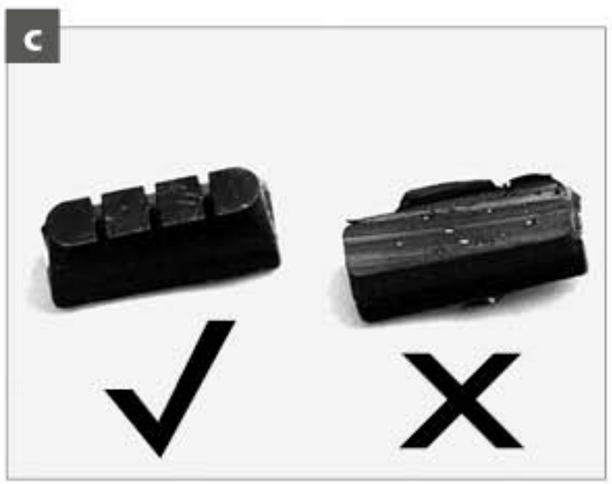
⚠ WARNING

Loose connections and leaky brake hoses can drastically impair the braking effect. If you find leaks in the brake system or buckled hoses, contact your CROSS dealer. Risk of accident!

Functional Check

Check whether the brake pads are accurately aligned with the rims and still sufficiently thick. You can judge the wear of the brake pads by the appearance of grooves. If the pads are worn down to the bottom of the grooves, it is time to replace them. Be sure to observe the according instructions of the respective manufacturers.

See your CROSS dealer and ask them to examine the remaining thickness of the rims when you have worn through your second set of brake pads at the latest. Your CROSS dealer has special measuring devices for determining the remaining thickness of the rims **(e)**.



The brake pads must hit the rim simultaneously and in parallel (a). This setting is to prevent the brake pads from screeching when applied.

The brake lever must always remain clear of the handlebar. You should not be able to pull it all the way to the handlebar (f), not even in the event of an emergency braking. If this is the case, however, observe the following chapter **"Synchronising and Readjusting"**.

Only a successful passing of all these test points will ensure a correctly adjusted brake.

⚠ WARNING

- ***Adjusting the position of the brake pads relative to the rims requires a considerable degree of skill. Replacing and adjusting the brake pads is a job best left to your CROSS dealer.***
- ***Have your rims regularly inspected and measured by the CROSS dealer.***

Synchronising and Readjusting

Hydraulic rim brakes are synchronised together with the alignment of the brake pads. At the same time the position of the brake lever where the brake starts to act, also referred to as pressure point, can be adjusted to the size of the hand as well as to individual convenience (g). For more information also observe the notes in the chapter **"Adjusting the Brake Lever Reach"**.

As the brake pads wear down, the pressure point moves towards the handlebar grips. Make absolutely sure you cannot pull the brake lever all the way to the handlebar grip. Most brake models, however, have a bolt (h) or a small knob at the brake lever unit to compensate the wear. For more information observe the brake manufacturer's instructions or contact your CROSS dealer.

SAFETY INSTRUCTIONS

- ***The manufacturers of brakes usually make available detailed operating instructions on their websites. Read them carefully before removing the wheel or doing any maintenance work. Improper operation can lead to brake failure.***

e

f

g

h

Disc Brakes

Operation and Wear

The most striking feature of disc brakes is their outstanding braking effect. They respond a lot faster in wet conditions than rim brakes do and achieve their normal high braking power within a very short time. They require little maintenance and do not wear down the rims as rim brakes do.

Disc brakes (a) consist of the brake calliper (1), the brake disc/rotor (2), the brake hose or cable (3) as well as the brake grip/lever (b). Actuating the brake lever compresses the hydraulic pistons through hydraulic pressure or mechanically, pushing the brake pads against the rotor.

The friction generated by braking causes wear to the brake pads (c) as well as to the rotors. Frequent rides in the rain and dirt and over hilly terrain can accelerate wear of the rotors. Depending on the manufacturer and the model there are different ways of checking the brake pads and rotors for their wear limits.

⚠ CAUTION

Disc brakes get hot in use. For this reason do not touch the rotors directly after stopping, especially after a long downhill ride.

⚠ WARNING

New brake pads have to be bedded in before they reach their optimal braking performance. For this purpose, accelerate the CROSS EPAC/EAPC 30 to 50 times to around 30 km/h (18 mph) and bring it to a halt each time. This procedure is finished, when the force required at the lever for braking has stopped decreasing.

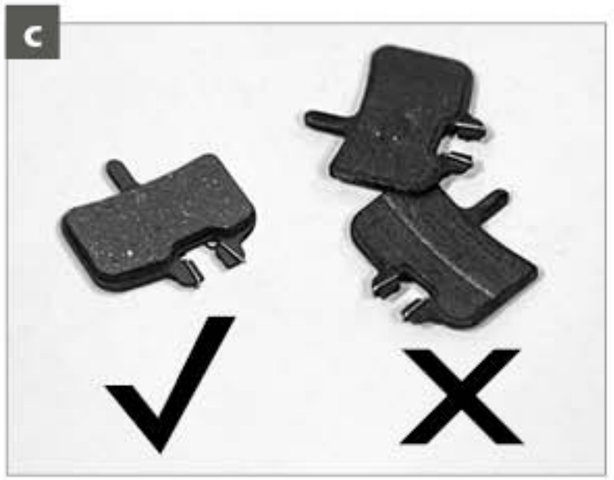
Dirty brake pads and rotors can result in a drastically reduced brake force. Therefore, make sure the brake remains free of oil and other fluids, especially when you clean your CROSS EPAC/EAPC or grease the chain. Dirty brake pads can under no circumstances be cleaned, they must be replaced! Brake discs/rotors can be cleaned with special brake cleaners and with a clean absorbing cloth or with warm water and detergent (d).

Unusual noises (scratching, chafing, etc.) during braking and/or a noticeable change of the brake force (stronger or weaker) are indications that the brake pads are soiled or worn down. Check the brake pads and replace them, if necessary. Otherwise you risk further damage, e.g. to the rotor, or even an accident due to brake failure! If you are in doubt, contact your CROSS dealer.

a

b

c



d

Hydraulic Disc Brakes

Functional Check

Regularly check the hoses (e) and connections for leaks while pulling on the lever. In case of a brake liquid leakage, contact your CROSS dealer immediately. A leak in the brake lines can render the brake ineffective. **Risk of accident!**

Wear and Maintenance

Check the pads for wear at regular intervals (f) by following the service instructions in the manual of the respective manufacturer made available on the website.

Measure the thickness of the brake pad on the mount by using a caliper gauge (g). The brake pad must all over be 0.5 mm thick at least. Measure the pad and the mount together as well as the mount alone; the difference is the thickness of the pad. Re-insert the cleaned brake pads into the cleaned calliper.

⚠ WARNING

Loose connections and leaky brake hoses drastically impair the braking effect. If you find leaks in the brake system or buckled hoses, contact your CROSS dealer immediately.

Do not place a CROSS EPAC/EAPC with hydraulic disc brakes upside down. Air could get into the system. This could render the brake ineffective (h). Risk of accident!

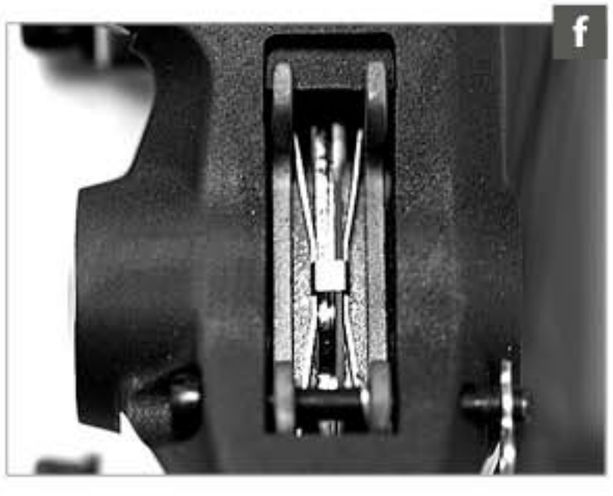
If your brake system works with DOT brake fluid, the latter needs to be replaced regularly according to the intervals prescribed by the manufacturer.

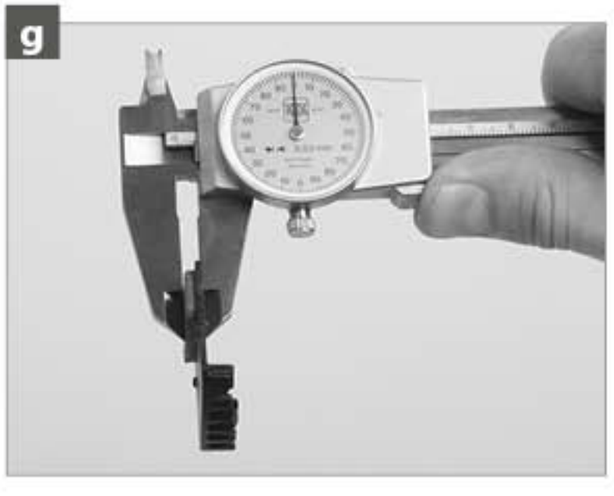
⚠ CAUTION

Do not open the brake hoses. Brake fluid that can be very unhealthy and damaging to the paint could leak out.

SAFETY INSTRUCTIONS

The manufacturers of hydraulic disc brakes may provide detailed instructions. They are certainly available on the respective websites. Be sure to read them carefully before removing a wheel or doing any maintenance work.





Mechanical Disc Brakes

Functional Check

The more brake pads of mechanical disc brakes wear down, the longer is the brake lever travel. Regularly check whether you get a positive braking response before the lever touches the handlebar. Make sure the brake cables are in sound condition!

⚠ WARNING

Damaged cables (a) should be replaced immediately, as they can snap. Risk of accident!

Wear and Maintenance

To a certain extent, wear of the brake pads can be compensated directly at the brake lever unit. Unscrew the union nut on the bolt through which the cable enters the grip (b) and then unscrew the bolt until the lever has the desired travel. Retighten the lock nut and make sure that the slot of the bolt does not face upward or forward, as this would permit an unnecessarily high amount of water or dirt to enter.

Now check the functioning of the brake and make sure the brake pads do not drag on the rotor (c+d) when you release the brake lever and let the wheel spin.

Repeated readjusting at the brake lever makes the arm on the brake calliper change its position. This can reduce braking effect and result in a complete brake failure in an extreme case. **Risk of accident!**

Some models offer further ways of adjusting the brakes directly at the brake calliper, though this requires a certain amount of skill. In any case, be sure to read the original instructions of the brake manufacturer before adjusting the brakes. If you are in doubt or if you have any questions, contact your CROSS dealer.

⚠ WARNING

Repeated readjusting at the brake lever unit only can severely reduce the maximum achievable braking effect.

SAFETY INSTRUCTIONS

The manufacturers of mechanical disc brakes may provide detailed instructions. They are certainly available on the respective websites. Be sure to read them carefully before removing a wheel or doing any maintenance work.

a

b

c

d

Roller, Drum and Back-Pedal Brakes

These types of brakes have an enclosed design; brake pads and surfaces inside the hub body are largely protected against the influences of the weather. The braking force is transmitted through cables from the levers to the brakes. As rear brake they are mostly connected to an internal gear hub (e) and sometimes they are operated by back pedalling.

With back-pedal brakes maximum brake force is achieved by stepping on one of the pedals in its rearmost position with the cranks horizontal. With internal gear hubs from SRAM the brake force increases by shifting into a lower gear.

The risk of overheating is particularly high with these brake systems. Brake overheating occurs on prolonged (steep) downhill rides with permanent brake dragging. Reduction of the brake force ("fading") is a result thereof which, in extreme cases, can lead to brake failure.

Therefore, if you notice that the braking effect deteriorates, stop and let the brake system cool down. Sometimes, it will be enough to operate the front and rear brake in an alternating pattern. If that will not suffice, stop for a couple of minutes before you set off again.

⚠ WARNING

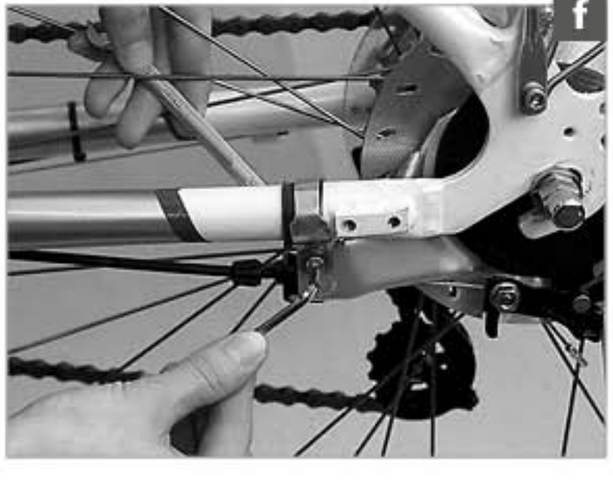
- ***Brake cables which are damaged, e.g. frayed, must be replaced immediately, as they can otherwise fail in a critical moment, possibly causing a fall!***
- ***If during braking the travel of the brake lever increases, unusual noises occur and/or the braking effect is more or less effective than usual, do not continue your ride. In such a case, contact your CROSS dealer immediately.***
- ***Check regularly whether the torque support is firmly attached to the frame (f) or fork. Use a torque wrench and never exceed the maximum torque values!***

Checking and Readjusting Back-Pedal Brakes

With back-pedal brakes the chain tension (g) has to be checked and retensioned, if necessary, after approx. 1,000 km (620 miles) or 50 hours of use. For more details read the chapter **"Chain – Care and Wear"**.

⚠ WARNING

- ***Keep in mind that the back-pedal brake is ineffective with a fallen-off chain (h). Risk of accident!***



GEARS

Derailleur Gears

The gears (a+b) of your CROSS EPAC/EAPC serve to adjust the gear ratio to the terrain you are riding on and the desired speed. In a low gear where the chain may run over the small chainring at the front and a large sprocket in the rear you can climb steep hills with moderate force. You must, however, pedal at a faster pace. A high gear ratio (possibly large chainring at the front, small sprocket in the rear) is for riding downhill. Every turn of the pedals takes you many metres forward at correspondingly high speed.

⚠ WARNING

Practise shifting in an area free of traffic until you are familiar with the functioning of the levers or twist grips of your CROSS EPAC/EAPC.

SAFETY INSTRUCTIONS

Read in any case the gear manufacturer's operating instructions possibly provided and make yourself familiar with gear shifting before you set off for the first time.

Operation and Control

Most CROSS EPACs/EAPCs have a rear derailleur, but no front derailleur. Nevertheless, you find all possibilities in the following.

Derailleur gears always work according to the following principle:

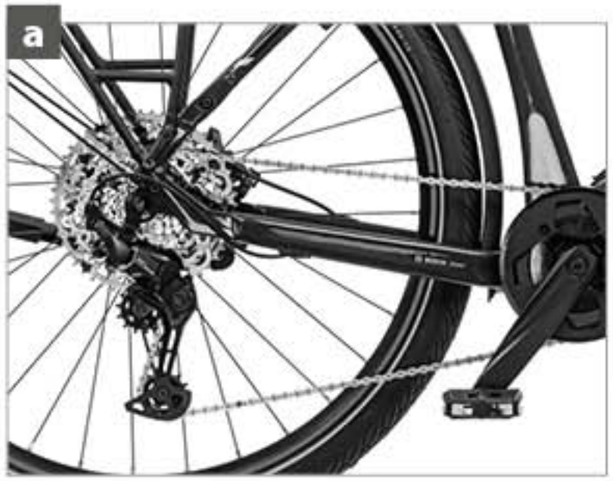
Large front chainring, if available – high/heavy gear – bigger gear ratio
Small front chainring, if available – low/easy gear – smaller gear ratio
Large rear sprocket – low/easy gear – smaller gear ratio
Small rear sprocket – high/heavy gear – bigger gear ratio

Normally, the shifters are mounted as follows:

Right-hand shifter– rear sprockets
Left-hand shifter – front chainrings

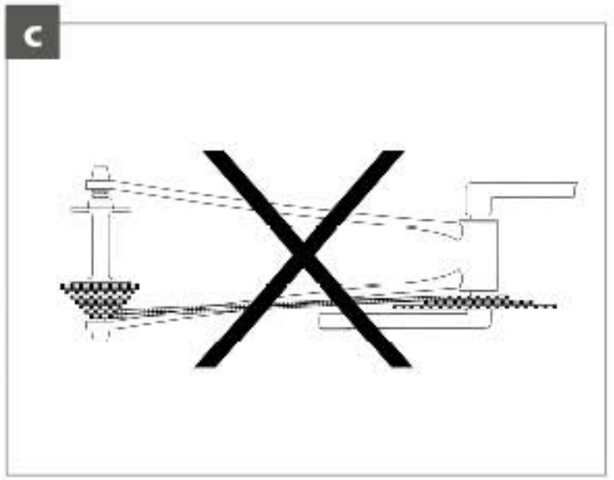
If your CROSS EPAC/EAPC has two or three chainrings, keep in mind that the numeric number of speeds is only theoretical, as there are overlaps. The chain should not run at an extreme angle, otherwise it wears down and the efficiency decreases. It is unfavourable e.g. when the chain may run over the smallest chainring at the front and over one of the two or three outermost (smallest) sprockets in the rear (c) or when it may run over the largest chainring and over one of the inmost (largest) sprockets of the rear wheel (d).

a

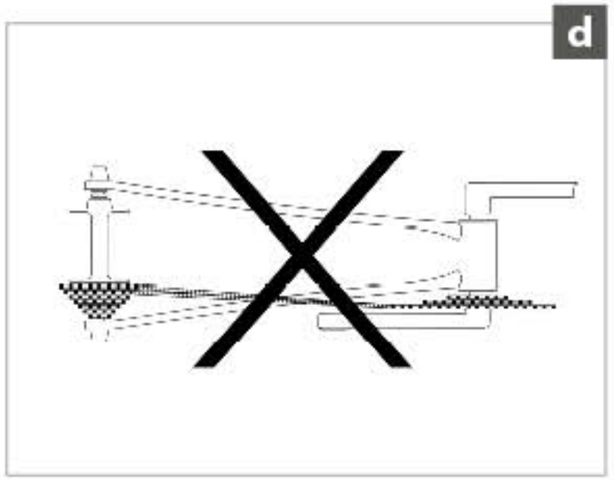


b

c



d



The bottom bracket (e) is the interface between cranks and frame. There are different designs, in some cases the bearing shaft is part of the bottom bracket, in some other cases it is integrated into the right crank. Sealed bottom brackets are maintenance free and delivered without play ex works. The bottom bracket in the frame and the cranks on the shaft must be checked for play at regular intervals.

Also check at regular intervals whether the cranks are firmly attached to the bearing shaft or whether there is play. Grab the crank and try to jiggle it forcefully. It must be absolutely free of play (f). If you notice any play, contact your CROSS dealer immediately.

Depending on the gear system, gear shifting is initiated by actuating a shifter or by a short turn of the wrist with twist grips (g). Continue pedalling during gear shifting, however, at reduced pedalling force.

The principles of the different shifters and their functioning is described in the following. It is, however, also possible that your new CROSS EPAC/EAPC has a rare gear system that is not mentioned here.

In the case of shifters pressing the large shifter (thumb shifter) moves the chain towards the larger chainrings/sprockets.

Shifting with the right thumb shifter therefore leads to a lower gear. This is an indexed shifting system with the option of shifting several gears with one action. Actuating the large thumb shifter on the left produces a higher gear.

Pulling the small lever located in front of the handlebar from the rider's viewpoint and actuated with the index finger (index finger lever) shifts the chain towards the smaller chainrings/sprockets, i.e. on the right side to the heavy gears and on the left side to the easy gears.

SAFETY INSTRUCTIONS

The manufacturers of gear systems may provide detailed instructions. Read them thoroughly. Make yourself familiar with your new gears in an area free of traffic, if necessary (h). If you are in doubt or if you have any questions, contact your CROSS dealer.

The principle is different with **twist grips**. Turning the right-hand grip towards you makes for a lower gear ratio, while the same movement on the left may produce a higher gear – and vice versa. The shifting direction may vary in this case, as well.

⚠ WARNING

- ***Always wear straight-cut trousers or use trouser clips or the like (a) to make sure your trousers do not get caught in the chain or the chainrings. Risk of accident!***
- ***Shifting gears under load, i.e. while pedalling hard, can make the chain slip. At the front derailleur, if available, the chain may even slip off the chainrings and cause an accident! At least the service life of the chain will be shortened considerably.***

NOTICE

- ***If there is play between bearing shaft and cranks, they can sustain damage. Risk of breakage!***
- ***If you have several chainrings avoid gears with the chain running at an extreme angle as this will increase wear!***
- ***It is therefore crucial when switching gears to continue pedalling smoothly and without too much force. Do not shift under load, in particular not at the front derailleur, if available (b), as this will shorten the service life of your chain considerably. Furthermore, this can lead to a chain-suck, i.e. the chain can get jammed between chainstay and chainrings.***

Checking and Readjusting

The derailleur gears of your CROSS EPAC/EAPC were carefully adjusted by your CROSS dealer before delivery (c). However, Bowden cables may stretch a little on the first kilometres/miles, making gear shifting imprecise and the chain rattle.

Adjusting the rear derailleur (d) and the possibly available front derailleur, accurately is a job for an experienced mechanic. If you want to try it by yourself, also observe the gear manufacturer's operating instructions made available on the website of the manufacturer. If you have any problems with the gears, contact your CROSS dealer.

⚠ WARNING

- ***For your own safety, bring your newly bought CROSS EPAC/EAPC to your CROSS dealer for its first inspection after 100 to 300 kilometres (60 to 180 miles), 5 to 15 hours of initial use or after four to six weeks, at the very latest, however, after three months.***

a

b

c

d

Adjusting the Rear Derailleur

Increase the tension of the cable by turning the adjustable cable stop at the shifter (e) or the adjusting bolt through which it runs into the rear derailleur (f). To do so, shift to the smallest sprocket and turn the bolts anticlockwise in half turns until the cable is slightly tensioned.

After tensioning the cable check that the chain immediately climbs onto the next larger sprocket. To find out you either have to turn the cranks by hand or ride the CROSS EPAC/EAPC and shift through the gears.

If the chain easily climbs onto the next larger sprocket, check that it just as easily shifts to the small sprockets. If it does not, release the respective adjusting bolt a little. You may need several trials.

⚠ WARNING

Adjusting the rear derailleur and the possibly available front derailleur accurately is a job for an experienced mechanic. Observe the instructions of the gear manufacturer. If you have any problems with the gears, contact your CROSS dealer.

SAFETY INSTRUCTIONS

Ask a helper to lift up the rear wheel. By turning the cranks and shifting through you can easily check the function.

Adjusting the Limit Stops

The rear derailleur is equipped with limit screws (g+h) which limit the movement range of the derailleur, thus preventing the derailleur and chain from colliding with the spokes or the chain from dropping off the smallest sprocket. The limit screws are adjusted by your CROSS dealer. They do not change their position during normal use.

If necessary, correct the position by means of the limit screws. The limit screws on rear derailleurs are often marked "H" for high gear and "L" for low gear. High gear means that the chain is running on the smallest sprocket. Turn the screw clockwise to move the rear derailleur towards the wheel and anticlockwise to move it away from the wheel.

Shift to the biggest (inmost) sprocket and check that the guide pulley of the rear derailleur is exactly below the teeth of the sprocket. Turn the limit screw marked "L" clockwise until the rear derailleur stops moving towards the spokes and can neither be moved by actuating the shifter nor by pushing it with your hand.

This adjustment prevents the chain from getting stuck between sprocket and spokes or the rear derailleur or the derailleur cage from colliding with the spokes, which could result in damage to the spokes, the rear derailleur and the frame. In the worst case, it could be impossible to continue cycling.

⚠ WARNING

- ***If your CROSS EPAC/EAPC has toppled over or the rear derailleur received an impact, there is the risk that the rear derailleur or its mount, also referred to as derailleur hanger, is bent. It is advisable to check its range of movement (a) and readjust the limit screws (b), if necessary, after such an incident or after mounting a new rear wheel on your bike.***
- ***Do a test ride in an area free of traffic, after you have adjusted the gears.***

NOTICE

- ***Poorly adjusted gears are one of the main causes for irreparable damage to frame, rear derailleur and wheel. Let your CROSS dealer maintain and service your CROSS EPAC/EAPC regularly.***

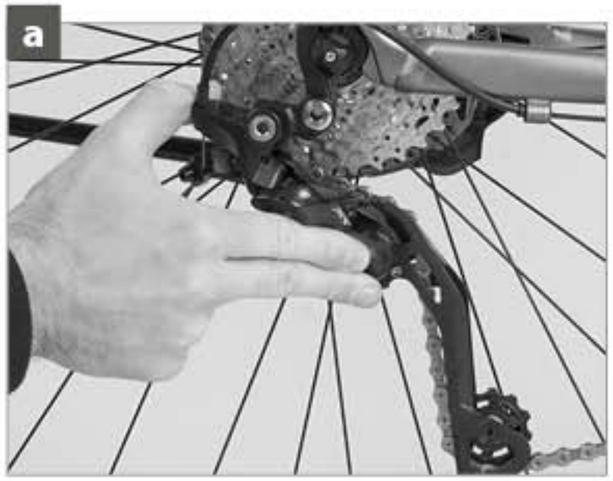
Adjusting the Front Derailleur (if available)

The range within which the possibly available front derailleur (c) keeps the chain on the chainring without colliding with the chain is very small. The swivelling range is reduced in the same way as with the rear derailleur, i.e. by turning the limit screws marked "H" and "L". The limit screws are adjusted by your CROSS dealer. They do not change their position during normal use.

As with the rear derailleur, the cable of the front derailleur is subject to lengthening which leads to a reduced precision in gear changing. If necessary, shift to the small chainring and increase the tension of the Bowden cable by turning the adjusting bolt through which it passes at the entry to the gear shifter (d).

⚠ WARNING

- ***After an accident check that the guide plates of the front derailleur are still parallel to the chainrings. Make sure they do not collide with the large chainring which would block the drive system. Risk of accident!***
- ***Adjusting the front derailleur is a very delicate job. Improper adjustment can cause the chain to jump off, thus interrupting the driving force. Risk of accident!***
- ***Do a test ride in an area free of traffic, after you have adjusted the gears.***



Multi-Speed Hubs (Internal Gear Hubs)

General Information on Multi-Speed Hubs

The gears of your CROSS EPAC/EAPC serve to adjust the gear ratio to the terrain you are riding on and the desired speed. A low gear allows you to climb steep hills with moderate pedalling force. You must, however, pedal at a faster pace. High gears are for riding downhill. Every turn of the pedals takes you many metres forward at correspondingly high speed.

The advantages of multi-speed hubs (e) are their enclosed design. Unlike derailleur gears the gear drive is within the hub body, only the primary ratio from the chainring to the sprocket being outside. What is more, all gears can be shifted through with one gear shifter (f).

Provided that it is serviced regularly, the drive chain has a comparatively longer service life than with derailleur gears. And this even more when it is protected from the influences of the weather by a sealed chain box.

With multi-speed hubs normally the power transmission and the gear ratio adjustment is guaranteed via one or several planetary gears, depending on the number of gears. To change gears the pedal force should be reduced significantly for a short time.

Always make sure changing gears makes as little noise as possible and is absolutely jerk free. This increases the service life considerably.

Make yourself familiar with the operation of your gears in a place free of traffic (g) and practise operating the shifters or the twist grips as well as the brake system, before using your bicycle on public roads.

In contrast to derailleur gears, multi-speed hubs cannot only be combined with manually actuated brakes (rim, drum, roller or disc brakes). They can also be actuated with back-pedal brakes (roller or drum brakes) by a reverse rotation of the pedals. Most effective braking is achieved with the pedals in horizontal position (h).

Removing and mounting wheels differs from that of derailleur gears. For more details read the chapters **"Tyre Puncture"** and **"Re-adjusting the Chain Tension"** and observe the notes given in the operating instructions of the manufacturer.

e

f

g

h

Operation and Control

The gear drive in multi-speed hubs is operated with a shifter that is usually positioned on the right side of the handlebar. The gear mechanism works either mechanically by cable or electronically by shift cable or by radio transmission (a).

During the shifting process you should interrupt pedalling or avoid strong pressure on the pedal.

If you have a back-pedal brake, be sure to use an additional second or if available a third brake for long and steep downhill rides (b) to avoid an overheating of the back-pedal brake.

Excessive heating of the hub (c) can result in a loss of lubricant and thus in reduced or strong braking power. In this case, be sure to contact your CROSS dealer.

Do not use the CROSS EPAC/EAPC until it has been repaired. Also observe the operating instructions of the hub manufacturer made available on their website.

⚠ WARNING

If untypical noises occur during braking or if the brake force decreases or increases unexpectedly, you should stop riding immediately and contact your CROSS dealer!

Check, Readjustment and Maintenance

Multi-speed hubs require only little maintenance and need not be adjusted very often. Check the chain tension (d), in particular when removing and mounting wheels and read in addition the chapter **"Chain – Care and Wear"**. If the gear steps do not engage and function trouble-free, even after the control or adjustment described in the following, contact your CROSS dealer.

⚠ WARNING

If your CROSS EPAC/EAPC has hydraulic disc brakes, do not place it upside down for repair purposes, i.e. handlebar and saddle on the ground. This would render the brake ineffective.

⚠ CAUTION

When working in the area of the rear wheel hub and its gear mechanism, be aware of the risk of crushing the fingers. Therefore, do not turn the cranks during the work or do not push the CROSS EPAC/EAPC backwards.

a

b

c

d

⚠ CAUTION

Brake discs/rotors, roller and back-pedal brakes can become hot. Let them cool down before doing any work on the wheels.

NOTICE

Do not pull the (disc) brake lever (e) with a removed wheel and make sure to mount the safety locks when removing the wheel.

SAFETY INSTRUCTIONS

In addition, observe the information and the operating instructions of the gear manufacturers. They are available on their websites:
https://support.enviolo.com/hc/en-us
www.pinion.eu/en/downloads/
www.rohloff.de/en/service
https://si.shimano.com

If you have any questions, contact your CROSS dealer.

Adjusting 5-/7-/8-/11-Speed Shimano Nexus and Alfine Internal Gear Hubs (Mechanically Operated)

Set the shifter to the setting gear required for the respective hub.

For the 5-speed Shimano Nexus it is gear 3. For the 7 and 8-speed Shimano Nexus and the 8-speed Shimano Alfine it is gear 4 (f). For the 11-speed Shimano Alfine it is gear 6.

Check the setting lines at the gear mechanism positioned on the right side of the hub in direction of motion. The mainly yellow setting lines under the window of the gear mechanism must be aligned (g).

If they are not, turn the barrel adjuster on the shifter gradually, i.e. in quarter turns, clockwise or anticlockwise (h), until the setting lines under the window are aligned.

Turn the crank and shift through all gears several times with the shifter before shifting back to the respective setting gear.

Re-check whether the setting lines are still aligned. If necessary, you have to slightly readjust the setting once again. Do to so turn the barrel adjuster on the shifter gradually once again clockwise or anti-clockwise until the setting lines are aligned.

Adjusting 14-Speed Rohloff (Mechanically Operated)

The setting of the 14 speeds of the Rohloff gears cannot be adjusted from outside.

The mark of the gear number and the play of the twist shifter can however be adjusted with the two barrel adjusters at the frame or at the gear box.

For the Rohloff hub with internal activation the barrel adjusters are in most cases on the top left or bottom rear stay in direction of motion (a). For the Rohloff hub with external activation they are located at the gear box. The gear box is on the left side of the Rohloff hub in direction of motion.

The mark on the twist shifter can be aligned without changing the cable tension (b).

To do so one of the barrel adjusters has to be screwed in and the other one to be unscrewed to the same extent (c).

The play of the twist shifter is adjusted via the cable tension with the barrel adjusters. Unscrewing both barrel adjusters increases, screwing in both barrel adjusters reduces the cable tension and thus the play. The play of the twist shifter should be approx. 1–2 mm. Proceed step-by-step, e.g. in quarter turns.

Adjusting Enviolo (Mechanically Operated)

The Enviolo gear is a stepless gearbox without fixed gear steps. Therefore, the gears cannot be adjusted.

The cable tension can be adjusted with the two barrel adjusters at the twist shifter (d). The ideal play is 0.5 mm.

SAFETY INSTRUCTIONS

The setting and diagnosis of electronically operated internal gear hubs (Shimano Alfine Di2, Rohloff E14, Enviolo H-Sync) can only be performed with the soft and hardware of the respective manufacturer. If you have any questions, contact your CROSS dealer.

Adjusting Pinion

The setting of the speeds of the Pinion gears (e) cannot be adjusted from outside.

The mark of the gear number and the play of the twist shifter can however be adjusted with the two barrel adjusters at the twist shifter (f).

The mark on the twist shifter can be synchronised without changing the cable tension. To do so one of the barrel adjusters has to be screwed in and the other one to be unscrewed to the same extent. Proceed step-by-step, e.g. in quarter turns.

The play of the twist shifter is adjusted via the cable tension with the barrel adjusters. Unscrewing both adjustment barrels increases and screwing in both adjustment barrels reduces the cable tension and thus the play.

The cable tension is properly set when the ends of the shift cable housings are in the barrel adjusters without play, but unpressurised. The play of the twist shifter should be approx. 2 mm.

Chain Tension

After a certain period of time every chain extends. On a CROSS EPAC/EAPC with multi-speed hub the chain play midway between chainring and rear sprocket should be approx. 1–2 cm (g). If there is more play, the chain has to be re-tensioned.

Check the chain tension in varying crank positions.

NOTICE

Adjusting the chain tension is only necessary on bikes with multi-speed hubs, because the chain on a bike with derailleur gears is automatically tensioned by the rear derailleur.

Re-adjusting the Chain Tension

To adjust the chain tension the two rear axle nuts and, if available, the clamp bolt (of the brake arm) have to be loosened (h). By pulling the rear wheel back in the dropouts the chain tension is increased until the optimum chain tension is reached.

e

f

g

h

Tighten the wheel nuts then to a torque value of 35 Nm (a) and the clamp bolt of the possibly available brake arm to a torque value of 3–4 Nm.

Some frame designs do not have a horizontally opened dropout. The dropouts are slidable and screwed to the frame instead. To tension the chain the bolted connection of the slidable dropout has to be released (b+c).

Regularly check the reliable fit of the bolted connection of the hub and, if available, of the brake arm on the frame.

Maintenance of the Internal Gear Hubs

Shimano recommends that you have lubricated the Nexus and Alfine internal gear hubs every second year or every 5,000 kilometres (3,000 miles) of intensive use (d). The 11-speed Alfine internal gear hub requires a first oil change after 1,000 kilometres (600 miles). Subsequently, the oil has to be changed every 5,000 kilometres (3,000 miles) or every two years. With this fact in mind read the operating instructions or contact your CROSS dealer.

Internal gear hubs must be maintained regularly. Observe the intervals in the chapter **"Service and Maintenance Schedule"**.

SAFETY INSTRUCTIONS

- ***In addition, observe the information and the operating instructions of the gear manufacturers. They are available on their websites:***
  https://support.enviolo.com/hc/en-us
  www.pinion.eu/en/downloads/
  www.rohloff.de/en/service
  https://si.shimano.com
- ***If you are in doubt or if you have any questions, contact your CROSS dealer.***

CHAIN – CARE AND WEAR

To ensure a long service life of the chain and its noise-free running, it is not the quantity but the distribution and regular application of lubricant that counts. Clean the chain from time to time by using an oily cloth and remove dirt and oil (e). Special degreasers are not necessary; they even have a damaging effect.

Apply chain oil, wax or grease to the bright chain links (f). Turn the crank and apply the lubricant to the rollers on the inner side of the chain. Once this is done, turn the chain a few more times; then let the EPAC/EAPC rest for a few minutes so that the lubricant can disperse. Finally wipe off excess lubricant with a rag so that it does not spatter around during riding or can collect road dirt.

⚠ WARNING

Make sure the braking surfaces of the rims, the brake discs/rotors and the brake pads remain clear of lubricants. This would render the brake ineffective.

NOTICE

For the sake of the environment, only use biodegradable lubricants, because in operation there is always some chain lubricant that ends up on the ground, especially in wet conditions.

Although chains are wearing parts on a bicycle, you can have an influence on its service life. Make sure the chain is lubricated regularly, especially after riding in the rain. Try to only use gears which run the chain in the straightest line between the sprockets and chainrings and get in the habit of high cadence pedalling.

Chains of derailleur gears are worn out after approx. 1,000 to 4,000 km (600 to 2,400 miles) or 50 to 200 hours of use. Heavily lengthened chains make gear shifting imprecise. Cycling with a worn-out chain also accelerates the wear of the sprockets and chainrings. Replacing these components is expensive compared to changing the chain. Therefore, check the condition of the chain at regular intervals.

Your CROSS dealer has accurate measuring instruments for checking the chain wear (g). Replacing the chain should ideally be left to an expert, as this requires special tools. In addition, you need to select a chain matching your gear system.

⚠ WARNING

An improperly joined or heavily worn chain can break and cause an accident.

SAFETY INSTRUCTIONS

When replacing your chain, only use appropriate and suitable original spare parts (h). Your CROSS dealer will be pleased to help you.

e

f

g

h

GATES BELT DRIVE

In the case of the Gates belt drive (a) a carbon drive belt (b) replaces the usual chain. Gates belts can only be combined with internal gear hubs and Pinion gears, however not with derailleur gears (c).

Maintenance and Care

Thanks to the carbon fibre surface, the belt remains free of dirt. Therefore, it will do to clean the belt with water, if necessary. The carbon drive belt must or may not be lubricated or oiled.

Checking the Belt Tension

The optimum operation of the Gates belt drive requires the proper tension of the belt. An unusually low tension can make the belt skip and thus affect the performance. Too high a tension of the belt will render the drive system sluggish and unnecessarily increase the wear of the belt and the bearings.

Setting the tension requires specific equipment and experience and is therefore a job for your CROSS dealer.

If you want to try it nevertheless: The tension can be easily adjusted with the Gates Carbon Drive™ mobile app (d) or the belt tension gauge (Gates Krikit Gauge).

SAFETY INSTRUCTIONS

Contact your CROSS dealer to have your Gates belt drive checked or re-tensioned. More information is also available at: www.gatescarbondrive.com

a

b

c

d

WHEELS AND TYRE EQUIPMENT

The wheel consists of the hub, the spokes and the rim. The tyre is mounted onto the rim so that it encases the tube. To protect the sensitive inner tube a rim tape (e) is placed or glued on the spoke nipples and the often sharp-edged rim well.

The rider's weight and the luggage as well as unevennesses in the field are considerable loads for the wheels. Although wheels are manufactured with great care and delivered accurately trued, spokes and nipples can lose a little tension on the first kilometres/miles. Therefore, ask your CROSS dealer to check and true up the wheels after a short "break-in" period already, i.e. after about 100 to 300 kilometres (60 to 180 miles) or 5 to 15 hours of initial use.

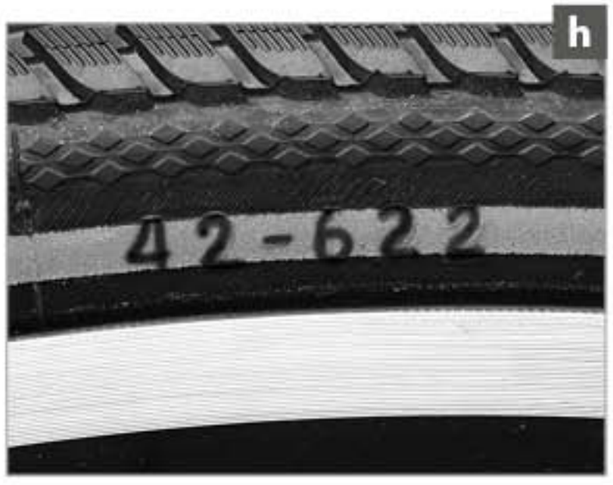
After the initial "break-in" period, check the wheels regularly (f). It will, however, rarely be necessary to tighten the spokes.

Tyres, Inner Tubes, Rim Tape, Inflation Pressure

The tyres should provide grip and traction. At the same time, they should run smoothly and absorb minor shocks from the road surface. Both rolling friction and grip depend on the nature of the tyre carcass, the rubber compound and the tyre tread. Your CROSS dealer has various types to choose from (g).

If you want to mount a new tyre, you have to take into account the system and the dimension of the previously mounted tyre. The latter is specified in two different units on the side of the tyre. One of the sizes is the standardised size in millimetres which is more precise, e.g. the number sequence 42-622 means that the tyre is 42 mm wide when fully inflated and has an (inner) tyre diameter of 622 mm (h). The other size is indicated in inches (e.g. 28x1.6").

Tyres must be inflated to the proper inflation pressure to provide an optimal compromise between smooth running and riding comfort. Properly inflated tyres are also more resistant to punctures. An insufficiently inflated tyre can result in a "snakebite" by pinching the inner tube, when it goes over a sharp kerb.



The air pressure recommended by the manufacturer is given on the tyre side or on the type label. The lower limit of the pressure specification means maximum comfort for light riders which is optimal for riding on rough surfaces. As the pressure increases, rolling resistance on level ground is minimized, while comfort decreases. Highly inflated tyres are therefore most suitable for heavy riders and for riding on tarred roads.

Inflation pressure is often given in the old system of units, i.e. in psi (pounds per square inch). The table (a) gives the most common pressure values in terms of both systems.

The tyre alone with the rim does not hold the air. To maintain the pressure inside an inner tube is placed inside the tyre and filled through a valve.

⚠ WARNING

Are the tyres in good condition and do they have sufficient pressure? A higher pressure gives a better riding stability and reduces the risk of a puncture. The minimum and maximum pressure (in bar or psi) is indicated on the tyre side.

Valves

There are three valve types in general use on today's CROSS EPACs/EAPCs:

1. **Sclaverand** or **Presta valve** (b): This valve is nowadays used on almost all types of bicycles. It is designed to withstand extremely high pressures.
2. **Schrader** or **American valve** (c): This is an adapted car tyre valve.
3. **Dunlop** or **Woods valve** (d): the usual valve.

All valve types come with a plastic cap to protect them from dirt.

The **Schrader valve** can be inflated with a suitable pump directly after removing the protective cap or filled at the petrol station with the compressed air pump.

In the case of **Presta valves** you first have to undo the small knurled nut a little and depress it carefully until air starts to escape. Check the fit of the valve body in the stem, otherwise air may slowly leak out. Do not forget to tighten by hand the valve nut after inflating.

a

psi	bar	psi	bar
45	3.1	75	5.2
50	3.4	80	5.5
55	3.8	85	5.9
60	4.1	90	6.2
65	4.5	95	6.6
70	4.8	100	6.9

b

c

d

Presta valves can be filled with a specific adapter with the compressed air pump at the petrol station. A compressed air pump must be used very carefully as you may otherwise overinflate the tyre and make it burst.

To let out air, shortly press the pin in the centre of the Schrader valve (e) or the knurled nut of the Presta valve (f).

In the case of the **Dunlop valve** unscrew the knurled nut until air comes out of the valve. Retighten the knurled nut subsequently. Normally, you have to inflate the tyre completely.

It can be hard to inflate tyres to the necessary pressure by using hand pumps. It is much easier with a foot-operated or a track pump equipped with a pressure gauge (g).

Always ride with the prescribed tyre pressure and check the pressure at least once a week.

⚠ WARNING

- ***Replace tyres with a worn tread or with brittle or frayed sides. Dampness and dirt penetrating the tyre can cause damage to its inner structure. The inner tube could burst. Risk of accident!***

⚠ WARNING

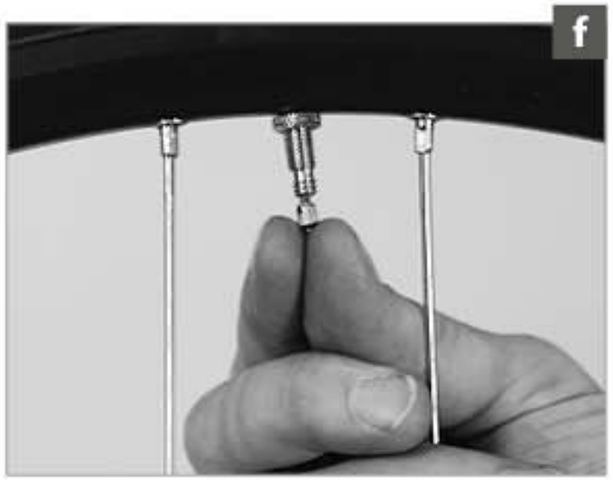
- ***Treat your tyres with care. Never inflate your tyres beyond the maximum permissible pressure. otherwise they might burst or come off the rim during the ride. Risk of accident!***
- ***Tyres allowing an inflation pressure of 5 bars and more have to be mounted on hooked-bead rims, identifiable by the designation "C". If you are in doubt or if you have any questions, contact your CROSS dealer.***
- ***If you mount a tyre of another size than the standard one, it may be that the tyre will rub against the suspension fork, the mudguard, the brakes or other components and sustain damage. This can even lock up the wheel. When buying tyres, ask your CROSS dealer for advice.***
- ***A higher pressure gives a better riding stability and reduces the risk of a puncture. The minimum and maximum pressure (in bar or psi) is indicated on the tyre side. Always ride with the prescribed tyre pressure and check the pressure at regular intervals, at least once a week*** (h).

SAFETY INSTRUCTIONS

- ***Observe the maximum pressure value of the rim. The pressure is dependent on the tyre width. You find the values in the enclosed instructions of the rim or wheel manufacturers.***

e

f



g

h

Rim Trueness and Spoke Tension

For the true running of the wheel the spokes must be tensioned evenly (a). If the tension of a single spoke changes, e.g. as a result of riding fast over a kerb or of a loose nipple, the tensile forces acting on the rim become unbalanced and the wheel will no longer run true. The functioning of your CROSS EPAC/EAPC may even be impaired before you notice the wobbling appearance of a wheel that has gone out of true.

With rim brakes the sides of the rims also serve as braking surfaces (b). An untrue wheel can impair the braking effect.

Therefore, check the wheels from time to time for trueness. For this purpose lift the wheel off the ground and spin it with your hand. Observe the gap between rim and brake pads (c) or between tyre and fork in the case of disc brakes. If the gap varies by more than one millimetre, you should ask a CROSS dealer to true the wheel (d).

⚠ WARNING

Do not ride with untrue wheels. In the case of extreme side-to-side wobbles, the brake pads of rim brakes can miss the rim and get caught in the spokes! This normally instantly jams the wheel and throws you off your bicycle.

NOTICE

Loose spokes must be tensioned at once. Otherwise the load on the other spokes and the rim will increase.

Truing (retruing) wheels is a difficult job which you should definitely leave to your CROSS dealer.

TYRE PUNCTURE

Flat tyres are the most common cause of puncture during cycling. However, as long as you have the necessary tools and a spare tube or a repair kit, this need not mean the end of your cycle tour. If your wheels are attached with quick-releases or thru axles to the frame and the fork, you only need two tyre levers and a pump.

SAFETY INSTRUCTIONS

Before removing a wheel read the chapters "Wheel Mounting" and "How to Use Quick-Releases and Thru Axles". If you are in doubt or if you have any questions, contact your CROSS dealer.

Wheel Removal – Brakes in General

In the case of **mechanical rim brakes** (V-brakes), you have to unhook the brake cable from the brake arm first (e). To do this, grip the rim with one hand and press the brake pads or the brake arms together. In this position the brake hose (of V-brakes) can easily be disengaged.

In the case of **hydraulic rim brakes** from Magura, open their quick-release lever on one side of the brake (f) and remove the brake from the cantilever socket.

If you have (hydraulic or mechanical) **disc brakes**, you should first check the exact position and condition of the brake pads and/or wear indicators (g). This will help you to verify subsequently, whether the brake pads are still in the proper position after dismounting. Read the possibly enclosed brake manufacturer's operating instructions. **Important:** Do not actuate the brake lever when the wheel is removed.

⚠ WARNING

If your CROSS EPAC/EAPC has hydraulic disc brakes, do not place it upside down (h) for repair purposes, i.e. handlebar and saddle on the ground. This would render the brake ineffective.

NOTICE

Do not pull the (disc) brake lever with a removed wheel and make sure to mount the safety locks when removing the wheel.

With some **drum and roller brakes** and **internal gear hubs** the torque arm supporting the drive and brake forces at the frame must be released. The shift cables must also be dismounted before removing the wheel (a).

Wheel Removal Front Wheel

The axle is clamped in the fork either by means of hex lock nuts (b) or by means of a quick-release lever or a thru axle (c).

⚠ CAUTION

Brake discs/rotors, roller and back-pedal brakes can become hot. Let them cool down before removing a wheel.

Front Wheel with Axle Nuts

To loosen the hex nuts you need a 15 mm open-end wrench or still better a 15 mm ring spanner (d).

If the front wheel is clamped with hex lock nuts, loosen the two axle nuts by three to four turns.

The axle nuts do not have to be dismounted completely. Slide both lock washers from the fork dropouts, if available.

⚠ WARNING

Most bicycles have integrated dropout safety tabs on their fork. In this case, no additional lock washers are necessary (e). A grooved washer has to be mounted between axle nut and fork nevertheless in a way that the grooves show towards the fork.

Front Wheel with Quick-Release or Thru Axle

Open the quick-release or the thru axle of the wheel, as described in the chapter **"How to Use Quick-Releases and Thru Axles"**.

If you still cannot remove the front wheel, this is in the case quick-releases often due to the dropout safety tabs. These are tabs in the fork ends (dropouts) (f). You have to release the preload nut of the quick-release a little and slip the wheel from the safety tabs.

SAFETY INSTRUCTIONS

If your CROSS EPAC/EAPC has thru axles, also observe the operating instructions of the fork manufacturer.

Front Wheel with Hub Dynamo

Loosen the plug connection from the hub dynamo's connection terminal first (g). Loosen then the axle nuts or the quick-release lever of the front wheel.

Wheel Removal Rear Wheel

If you have **derailleur gears**, you should shift the chain to the smallest sprocket before removing the rear wheel. This shifts the rear derailleur right to the outside where it does not interfere with the removal of the wheel.

Open the quick-release of the wheel, as described in the chapter **"How to Use Quick-Releases and Thru Axles"**.

In the case of derailleur gears, you will find it easier to remove the rear wheel, when you pull the rear derailleur slightly backwards (h). Lift the CROSS EPAC/EAPC off the ground and give the wheel a gentle tap with your hand so that it drops out.

⚠ WARNING

If your CROSS EPAC/EAPC has hydraulic disc brakes, do not place it upside down for repair purposes, i.e. handlebar and saddle on the ground. This would render the brake ineffective.

⚠ CAUTION

When working in the area of the rear wheel hub and its gear mechanism, be aware of the risk of crushing the fingers. Therefore, do not turn the cranks during the work or do not push the CROSS EPAC/EAPC backwards. Remove, as far as possible, the rechargeable battery or the display before doing any work on your CROSS EPAC/EAPC (e.g. servicing, repairs, assembly, maintenance, work on your drive system, etc.). Activating the drive systems unintentionally bears the risk of injury!

Brake discs/rotors, roller and back-pedal brakes can become hot. Let them cool down before removing a wheel.

NOTICE

Do not pull the (disc) brake lever (a) with a removed wheel and make sure to mount the safety locks (b) when removing the wheel.

SAFETY INSTRUCTIONS

In addition, observe the information and the operating instructions of the gear manufacturers. They are available on their websites:
https://support.enviolo.com/hc/en-us
www.pinion.eu/en/downloads/ www.rohloff.de/en/service
https://si.shimano.com www.sram.com/en/service

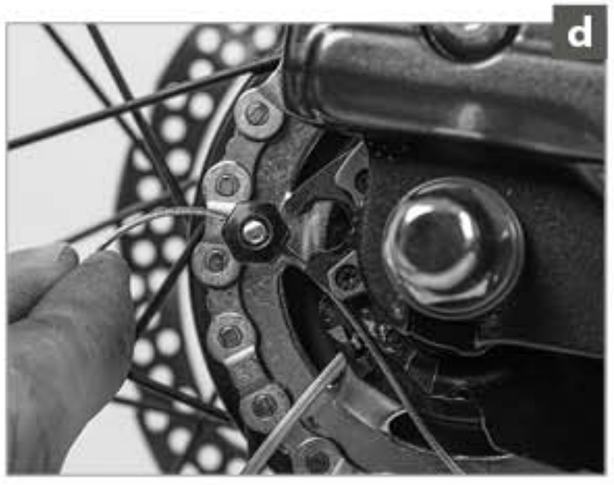
If you have any questions, contact your CROSS dealer.

With 5-/7-/8-/11-Speed Shimano Nexus and Alfine Multi-Speed Hubs

First relieve the shift cable by shifting to gear one with the twist shifter.

Pull the cable housing from the limit stop in the gear unit positioned on the right side of the hub in direction of motion (c). Remove the shift cable including threaded nipple from the guide and its mount (d).

The gear unit shows a high spring preload. The shift cable is dismounted opposite to this spring preload and therefore requires a certain manual force. You can also use a 2 mm Allen key to relieve the mechanism (e).



Now loosen the axle nuts anticlockwise by means of an open-end spanner or still better with a ring spanner. In most cases, the axle nuts do not have to be removed completely. It will do to release them by a few turns. Slide the lock washers on the axle outwards so that the metal catches no longer engage with the dropout. If you remove the axle nuts and the lock washers (f) completely from the axle, note the mounting position of the lock washers for later re-mounting.

Now you can remove the rear wheel from the dropouts of the frame. Subsequently, take down the chain and remove the wheel from the frame.

If your CROSS EPAC/EAPC has a drive belt, it has to be absolutely free of tension before you take it down carefully and without bending from the rear belt sprocket. The belt must be easy to remove.

SAFETY INSTRUCTIONS

Depending on tyre equipment and frame design it may be helpful to deflate the tyre partly or even completely before removing the rear wheel.

SAFETY INSTRUCTIONS

If your CROSS EPAC/EAPC has horizontal dropouts open towards the rear (g), the removal of the rear wheel deviates from the above-described proceeding. This requires, however, a high degree of craftsmanship. If you are in doubt or if you have any questions, contact your CROSS dealer.

With 5-/7-/8-Speed Shimano Nexus Multi-Speed Hubs with Back-Pedal Brake

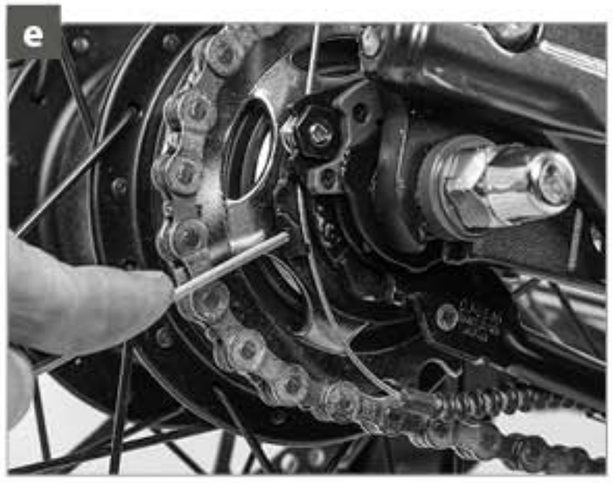
The removal is basically the same as the above-described removal with the 5-/7-/8-/11-speed Shimano Nexus and Alfine internal gear hubs. However, before you loosen the axle nuts of the rear wheel also loosen the bolt of the brake arm clip (h) completely and remove it including nut.

With 14-Speed Rohloff (Mechanically Operated)

Before removing the rear wheel the shift cables have to be separated or the gear box (a, p. 82) has to be detached from the hub.

If you have a Rohloff hub with internal activation, set a middle gear with the twist shifter first. Subsequently, both bayonet connectors have to be loosened by turning them opposite to one another.

e



f

g

h

If you have a Rohloff hub with external activation, set gear 14 with the twist shifter first. After unscrewing the grooved bolt the gear box can be removed from its mount at the hub (b).

NOTICE

As long as the gear box is removed from the hub the twist shifter should not be activated until the gear box was screwed back to the hub after re-mounting of the rear wheel.

Loosen the quick-release lever or the lock nuts subsequently. Now you can take down the chain and remove the rear wheel from the frame.

If your CROSS EPAC/EAPC has a drive belt, it has to be absolutely free of tension before you take it down carefully and without bending from the rear belt sprocket. The belt must be easy to remove.

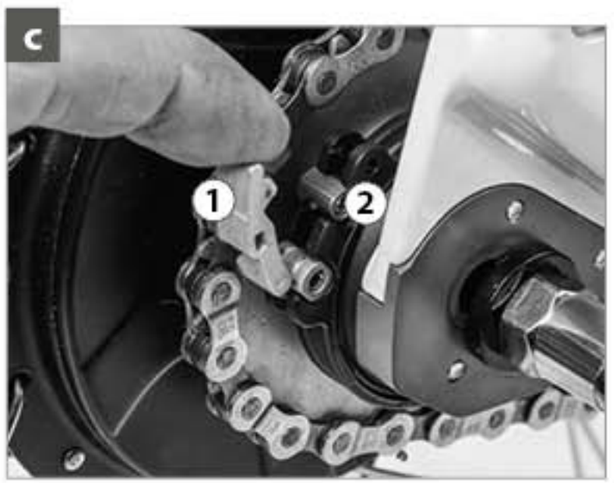
With Enviolo (Mechanically Operated)

Before removing the rear wheel the cables have to be removed from the gear mechanism. Undo the shift cable with fastener (c) from its guide (1) and also remove the second shift cable (2) including its threaded nipple (d) from the gear mechanism.

Now loosen the axle nuts anticlockwise by means of an open-end spanner or still better with a ring spanner. In most cases, the axle nuts do not have to be removed completely. It will do to release them by a few turns. Slide the lock washers on the axle outwards so that the metal catches no longer engage with the dropout. If you remove the axle nuts and the lock washers completely from the axle, note the mounting position of the lock washers for later re-mounting.

Now you can remove the rear wheel from the dropouts of the frame. Now you can take down the chain (e) and remove the wheel from the frame.

If your CROSS EPAC/EAPC has a drive belt, it has to be absolutely free of tension before you take it down carefully and without bending from the rear belt sprocket. The belt must be easy to remove.



SAFETY INSTRUCTIONS

Depending on tyre equipment and frame design it may be helpful to deflate the tyre partly or even completely before removing the rear wheel.

With Pinion

Loosen the quick-release lever, the thru axle or the lock nuts. Loosen the plug connections for the motor/drive unit. Now you can take down the chain and remove the rear wheel from the frame.

If your CROSS EPAC/EAPC has a drive belt (f), it has to be absolutely free of tension before you take it down carefully and without bending from the rear belt sprocket. The belt must be easy to remove.

SAFETY INSTRUCTIONS

Depending on tyre equipment and frame design it may be helpful to deflate the tyre partly or even completely before removing the rear wheel.

Clincher and Folding Tyres

Tyre Removal

Remove the cap and the fastening nut from the valve and deflate the tyre completely (g). Press the tyre from the rim side towards the centre of the rim. This will ease the removal.

Apply a plastic tyre lever under one bead of the tyre about 5 cm beside the valve and lever the tyre side over the rim edge (h). Hold the lever in this position. Slip the second tyre lever between rim and tyre at a distance of about ten centimetres on the other side of the valve and lever the next portion of the bead over the edge of the rim.

After levering a part of the tyre side over the edge of the rim you should normally be able to slip off the whole tyre on one side by moving the tyre lever around the whole circumference. Now you can remove the inner tube. Make sure the valve does not get caught in the rim, as this can damage the inner tube. If necessary, you can remove the whole tyre by pulling the other tyre side off the rim. Repair the puncture according to the instructions of the repair kit manufacturer or replace the inner tube.

When you have removed the tyre, you should also check the rim tape (a). It should be positioned evenly, covering all spoke nipples and holes, and must not be damaged or brittle.

In the case of double wall rims the tape must cover the entire rim base, but it should not be so broad as to stand up along the inside edges of the rim. Rim tapes for this type of rim should only be made of fabric or durable plastic. If you are in doubt or if you have any questions, contact your CROSS dealer.

If you have a puncture en route, inflate the inner tube and bring it close to your ear. In most cases you can hear the air coming out. At home you can help yourself with a bucket of water where you can locate the hole by the bubbles. When you have found the hole, look for the corresponding place on the tyre and check it, as well. Often the foreign body sticks in the tyre. Be sure to remove it, otherwise the next puncture is likely to occur.

⚠ WARNING

If the fabric of the tyre is destroyed by the perforating object, replace the tyre to be on the safe side.

Replace spoilt rim tapes immediately.

NOTICE

When buying spare tubes, make sure you choose a valve matching the rim. Presta and/or Sclaverand valves can sustain damage when mounted on rims for Schrader valves. Risk of a sudden loss of air. Schrader valves neither fit all rims.

Tyre Mounting

When mounting a tyre make sure no foreign matter, such as dirt or sand, gets inside the tyre and you do not damage the inner tube in the process.

Slip one bead of the tyre onto the rim. Press one side of the tyre with your thumbs over the edge of the rim around the entire circumference. This should normally be possible without using tools.

Stick the valve of the inner tube through the valve hole in the rim (b). Inflate the inner tube slightly so that it becomes round and push it into the tyre all the way round. Make sure not to leave any folds in the inner tube.

To finish mounting the tyre, start at the opposite side of the valve. Press the tyre as far as possible with your thumbs all around over the rim side.

Make sure the inner tube does not get pinched and squashed between the tyre and the rim. You can prevent this by pushing the inner tube into the hollow of the tyre (c) with a finger as you work along.

Work the tyre into the rim by approaching the valve symmetrically from both sides. Towards the end, you will have to pull the tyre forcefully downwards (d) to make the already mounted section of the tyre slip towards the deepest part of the rim well. This will ease mounting noticeably on the last centimetres.

Before fitting the tyre completely on the rim check again whether the inner tube lies properly inside the tyre and press the last stretch of tyre over the edge of the rim using the balls of your thumbs.

If this does not work, you have to use the tyre levers (e). Make sure the bent ends point towards the inner tube and do not damage the inner tube.

Push the valve a little into the tyre so that the inner tube does not get caught between the rim and the tyre beads. Check that the valve stands upright. If not, dismount one tyre side again and reposition the inner tube.

To make sure the inner tube is not pinched between the rim and the bead, move it sideways back and forth between the sides of the rim. While doing so, also check whether the rim tape has shifted.

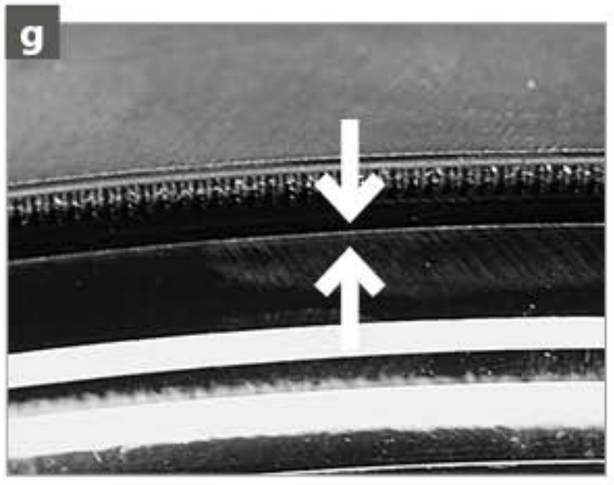
Inflate the inner tube to the desired pressure (f). The maximum pressure is indicated on the side of the tyre.

Check whether the tyre is properly seated by inspecting the fine indicator line (g) just above the rim edge. This line should be even to the rim all around the tyre. Now adjust the pressure through the valve by starting with the maximum tyre pressure. Observe the recommended tyre pressure range (h).

e

f

g



h

Wheel Mounting

⚠ WARNING

If your CROSS EPAC/EAPC has hydraulic disc brakes, do not place it upside down for repair purposes, i.e. handlebar and saddle on the ground. This would render the brake ineffective.

NOTICE

Do not pull the (disc) brake lever with a removed wheel and make sure to mount the safety locks when removing the wheel.

SAFETY INSTRUCTIONS

If you have any questions, contact your CROSS dealer.

Mounting the wheel is generally done in reverse order to the removal. Make sure the wheel is properly seated in the dropouts and accurately centred between the fork legs or the seat and chainstays. Make sure the quick-release and the possibly available safety tabs are properly seated (a).

For more information see the chapter **"How to Use Quick-Releases and Thru Axles"**.

If you have **disc brakes**, check before mounting the wheel whether the brake pads rest snugly in their seats in the brake calliper. The gap between the brake pads and the wheel should be parallel and the wear indicators in their correct position. Make sure you slide the brake disc/rotor between the brake pads (b).
After mounting the wheel and tightening the axle nut or the quick-release and a thru axle, if available, pull the brake lever (c) (several times, if you have disc brakes).

In the case of **mechanical rim brakes** re-mount the cable and in the case of **hydraulic rim brakes** re-install the removed brake unit. Close the clamping lever.

Lift the CROSS EPAC/EAPC and spin the wheel with your hand (d). With the wheel spinning the rotor should not drag along the brake calliper or the brake pads and the rim should keep off the (rim) brake pads.

a

b

c

d

Wheel Mounting Front Wheel

Front Wheel with Hub Dynamo

When mounting a front wheel with hub dynamo (e) make sure the hub dynamo's connection terminal is on the right side in direction of motion. The connection terminal has to be aligned with the front wheel fork in a way that it points slightly backwards and upwards (f). Do not try to turn the connection terminal after having fixed the front wheel in the fork.

If your front wheel has no quick-release, you need a 15 mm open-end wrench or ring spanner (g) or still better a torque wrench to tighten the axle nuts.

Axle nuts have to be tightened alternately on both sides. Otherwise the hub axle can twist with the lock washers and be subject to stress. The torque value is 20–25 Nm.

After you have securely fixed the wheel in the fork, re-connect the plug of the lighting cable to the connection terminal.

⚠ WARNING

Never ride with the plug connection (h) disconnected, as the lighting cable can get caught in the spokes. Risk of accident!

Finish by checking the front and rear lights on the bicycle by turning the front wheel.

Wheel Mounting Rear Wheel

⚠ CAUTION

When working in the area of the rear wheel hub and its gear mechanism, be aware of the risk of crushing the fingers. Therefore, do not turn the cranks during the work or do not push the CROSS EPAC/EAPC backwards.

SAFETY INSTRUCTIONS

In addition, observe the information and the operating instructions of the gear manufacturers. They are available on their websites:
https://support.enviolo.com/hc/en-us
pinion.eu/en/downloads/
www.rohloff.de/en/service
https://si.shimano.com
www.sram.com/en/service

If you have any questions, contact your CROSS dealer.

With 5-/7-/8-/11-Speed Shimano Nexus and Alfine Multi-Speed Hubs

Insert both lock washers on the left and right side of the hub axle in direction of motion. Turn the hub axle in a way that the metal catches of the lock washers engage with the recesses of the dropouts (a). Mount the axle nuts on both sides of the hub axle.

Tension the chain and tighten the axle nuts to 30-45 Nm (b) to attach the wheel to the frame.

Re-mount the shift cable to the gear mechanism of the multi-speed hub. Hook the shift cable including threaded nipple in the guide of the gear mechanism (c). Position the shift cable along the intended guide around the gear mechanism. Pull the cable housing to the front (d) and hook it into the holder of the gear mechanism.

⚠ WARNING

After having mounted the rear wheel and the shift cable check the setting and the function of the gears (e).

The gear unit shows a high spring preload. The shift cable is mounted opposite to this spring preload and therefore requires a certain manual force and technical skills. You can also use a 2 mm Allen key to relieve the mechanism (g).

⚠ WARNING

Check the function of the brake and that the wheel rotates easily before you set off.

With 5-/7-/8-Speed Shimano Nexus Multi-Speed Hubs with Back-Pedal Brake

Insert both lock washers on the left and right side of the hub axle in direction of motion. Turn the hub axle in a way that the metal catches of the lock washers engage with the recesses of the dropouts (a). Mount the axle nuts on both sides of the hub axle.

Align the bore in the brake arm with the bore in the brake arm clip and insert the clamp bolt. Place a nut including washer from the rear on the clamp bolt thread. Screw these components by 3 to 4 turns on one another.

Tension the chain and tighten the axle nuts to 30–45 Nm (b) to attach the wheel to the frame.

Tighten the clamp bolt of the brake arm to a torque value of 3–5 Nm (f). Make sure that the thread projects from the clamp nut by about 2–3 mm. If it does not, you need a longer bolt.

Re-mount the shift cable to the gear mechanism of the multi-speed hub. Hook the shift cable including threaded nipple in the guide of the gear mechanism. Position the shift cable along the intended guide around the gear mechanism. Pull the cable housing to the front (d) and hook it into the holder of the gear mechanism.

⚠ WARNING

After having mounted the rear wheel and the shift cable check the setting and the function of the gears (e).

The gear unit shows a high spring preload. The shift cable is mounted opposite to this spring preload and therefore requires a certain manual force and technical skills. You can also use a 2 mm Allen key to relieve the mechanism (g).

⚠ WARNING

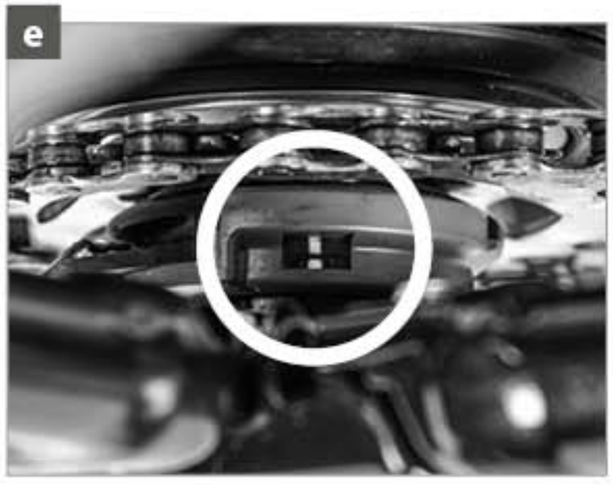
Check the proper function of the brake and that the wheel rotates easily before you set off.

With 14-Speed Rohloff (Mechanically Operated)

Mounting the rear wheel with a Rohloff speedhub is generally done in reverse order to the removal.

Make however sure the torque arm is positioned properly (h).

For more information read the operating instructions of the gear manufacturer or contact your CROSS dealer.



With Enviolo

Place the rear wheel into the frame. Make sure not to clamp the shift cables in doing so. Insert one no-turn washer (a) respectively on either end of the axle. The grooves of the no-turn washer must point to the rear frame. The rectangular boss must engage in the rear frame. Tighten the axle nuts to a torque value of 30–40 Nm. If your CROSS EPAC/EAPC has roller brakes, observe the operating instructions of the manufacturer. Mount both shift cables to the gear mechanism according to the manufacturer's instructions.

With Pinion

Mounting the rear wheel of a CROSS EPAC/EAPC with Pinion gearbox is generally done in reverse order to the removal.

⚠ WARNING

- ***If you have disc brakes, pull the brake levers (b) several times after you have mounted the wheel. You must reach a precise pressure point.***
- ***If you have rim brakes, make sure you hook up the brake cable immediately after the wheel mounting!***

⚠ WARNING

- ***If you have hydraulic rim brakes, remount the brake body immediately and close the quick-release (c)! Make sure the brake calliper does not touch the rim, the tyre or the spokes, when the wheel rotates.***
- ***Before setting off again check whether the brake surfaces and/or rotors are still free of grease or other lubricants after the wheel mounting.***
- ***If you have a hub dynamo, re-insert the connector into the respective connecting terminal.***
- ***Check whether the brake pads hit the brake surfaces of the rims (d). Make sure the wheel is properly seated and firmly fixed in the dropouts. Be sure to do a brake test in standing as described in the chapter "Before Every Ride"!***

NOTICE

- ***Improper mounting of the no-turn washer may result in damage to the rear frame and the hub. Overtightening may damage parts, undertightening may result in the axle sliding in the rear frame.***

a

b

c

d

HEADSET

The headset connects the fork to the frame and allows the fork to rotate freely. This steering area must be able to rotate easily for the CROSS EPAC/EAPC to stabilise itself and to ride straight ahead. Shocks caused by uneven road surfaces expose the headset to considerable levels of stress. In this way it can become loose and go out of correct adjustment.

⚠ WARNING

Riding the bicycle with a loose headset increases the loads on the fork and the bearing. The fork can break. Risk of accident!

Checking and Readjusting

Check the headset for play by placing your fingers around the upper headset cup (e).

Bring your weight to bear on the saddle, pull the front brakes with your other hand and push the EPAC/EAPC firmly back and forth with the wheel remaining on the ground (f). If the bearing has play, you will feel the upper head tube race moving in jerks relative to the lower head tube race – visible as a small gap between the head tube races.

To check whether the headset runs smoothly, lift up the frame until the front wheel no longer touches the ground. The handlebar should turn from far left to far right without feeling roughness or tightness at any point. With a gentle tap on the handlebar the fork should turn easily from the middle position (g).

If you face any problems during the test, contact your CROSS dealer.

⚠ WARNING

Check the secure seat of the stem after having adjusted the headset, by holding the front wheel between your knees and trying to turn the handlebar relative to the front wheel (h). Otherwise, a loose stem can cause an accident.

SAFETY INSTRUCTIONS

Adjusting the headset requires a certain amount of experience and should therefore be left to your CROSS dealer.

SUSPENSION

Glossary

Suspension fork
Bicycle fork absorbing and damping shocks via moving components. The most common among these forks are telescopic suspension forks (a). What is designated as stanchion tubes are the thinner tubes press fitted or screwed to the fork crown of a telescopic fork. What is designated as lower legs are the lower tubes the stanchion tubes slide in.

Spring rate or hardness
Force required to compress the spring by a certain travel – measured in Newton per millimetre (N/mm) or pound per inch (lbs/in). A higher spring rate requires more force for the travel. With air spring elements a higher rate means a higher pressure.

Spring preload
In the case of the widespread air spring systems, the air pressure in the fork is crucial for the spring rate and the spring preload. Observe the manufacturer's recommendations. Within a certain range a preload can be applied to the steel springs. Then the suspension only reacts when a greater load is applied. The spring rate remains, however, unchanged. Heavier riders cannot compensate a too soft spring rate with a higher preload.

Negative spring travel – "sag" (b)
The travel of the rear frame or the fork during compression when the rider takes up his or her usual riding position at a standstill. This is usually specified as a percentage of the overall travel.

Rebound damping (c)
In most cases a red adjusting knob. Decelerates and/or slows down the speed at which the fork or shock recovers or bounces back. Prevents the bobbing of the CROSS EPAC/EAPC.

Lockout (d)
In most cases a lever on the suspension element or the handlebar. A device to block the fork or the rear shock so that the suspension element does not cause bob when riding on tarred roads or smooth surfaces. Not to be used when riding off road.

Platform damping
Increases the (low speed) compression damping rate and eliminates bobbing. In contrast to the lockout function, the suspension is not blocked completely.

SUSPENSION FORKS

Suspension forks on CROSS EPACs/EAPCs (e+f) ensure a better control of the CROSS EPAC/EAPC on field and forest trucks or on poor road surfaces as the tyre keeps better ground contact. The strain on you and your CROSS EPAC/EAPC caused by the mechanical shocks from the terrain are noticeably reduced. Suspension forks differ in their types of spring elements and damping. The suspension is usually provided by coil springs, specific types of plastic (elastomers) or sealed air compartments or combinations of them. Damping is usually done with oil or the self-damping properties of the elastomers.

SAFETY INSTRUCTIONS

Suspension fork manufacturers normally supply their products with instructions. Read them carefully before changing any settings or doing any maintenance work on your suspension fork. More information is e.g. available at:
https://rstsuspension.com
www.ridefox.com www.rockshox.com www.srsuntour.com

Adjusting the Spring Rate

To work perfectly, the fork has to be adjusted to the weight, the sitting posture and the intended use. The suspension fork should yield by about 10–25 % of its total travel (sag) under the rider's weight.

Be sure to have this adjustment carried out by your CROSS dealer at the moment of delivery.

If you can hear the fork hit the end of its travel in the terrain or on poor road surfaces, the spring is adjusted too soft. The spring preload/the pressure of a coil spring or an air spring has to be increased (g). If the setting range with coil springs is too small, have the springs replaced by your CROSS dealer.

⚠ WARNING

Suspension forks are designed in a way that they can or must absorb shocks. If the fork is too rigid and jammed, shocks are undiminished introduced in the frame which is usually not designed for that. If your suspension fork has a lockout mechanism (h), do not activate the lockout function when riding over rough terrain (e.g. on smoothly tarred roads).

The suspension fork must be designed and adjusted in a way that it only bottoms out in extreme cases. A spring rate which is too soft (or too low an air pressure) can usually be heard or felt as a "clunk" type noise. This noise is caused by the sudden complete compression of the suspension fork as it reaches bottom out. If the suspension fork frequently reaches bottom out, it will sustain damage over time, and so will the frame.

e

f

g

h

Damping and Lockout

Damping is adjusted via valves inside. Excessive bobbing of the suspension fork after having ridden over an obstacle is prevented.

For long uphill rides involving hard pedalling out of the saddle it is advisable to disable the damping, if the suspension fork has a lockout mechanism. For downhill rides on uneven ground the lockout mechanism must be open.

Suspension forks with adjustable **rebound damping** have an adjusting knob to slow down or accelerate the rebound movement. Start the adjusting with a completely open damping ("-"). Ride over an obstacle (e.g. a kerb) and turn the rebound damping in small steps towards the "+" setting. You have found the proper rebound setting when the suspension fork does not cycles more than once. Always check a modified adjustment during a test ride.

⚠ WARNING

- ***A too strong damping of the fork can result in a sluggish rebound movement with a suspension fork that will not recover when exposed to a quick series of impacts. Risk of accident!***

⚠ WARNING

- ***Do not turn any screws in the vague hope of adjusting them somehow. You could release the fastening mechanism, thus causing a fall. All manufacturers normally mark adjustment devices with a scale or with "+" signs (a) (for stronger damping/ harder suspension) and with "-" signs (b).***
- ***When mounting a new front tyre, make sure the dimension/ width and suitability for being used on EPACs/EAPCs are exactly the same. If the tyres are not suitable, the front wheel may get jammed. Risk of accident!***
- ***Do not ride, if the suspension fork often bottoms out. This could damage the fork itself and the frame.***
- ***Do not actuate the lockout function when riding over rough field tracks, but only when riding over smooth terrain (roads, field tracks) (c).***

SAFETY INSTRUCTIONS

- ***Contact your CROSS dealer or follow the respective notes in the operating instructions of the suspension fork manufacturer (d).***

a

b

c

d

Maintenance

Suspension forks are components of sophisticated design that require regular maintenance and care. This has led almost all suspension fork manufacturers to establish service centres where you can have your fork thoroughly checked and overhauled at regular intervals according to use, e.g. once a year. Be sure to have all bolted connections checked at regular intervals by your CROSS dealer.

The following routines are essential for maintenance:

Make sure the sliding surfaces of the stanchion tubes are absolutely clean.

Clean the fork with water and a soft sponge (e) when soiled.

After washing your CROSS EPAC/EAPC, spray the stanchion tubes of the suspension fork with a little grease spray (f) approved by the suspension fork manufacturer or apply a very thin film of hydraulic oil. Compress the fork several times and wipe off excess lubricant with a clean rag before you set off for your next ride.

Do not use a steam jet (g) or aggressive cleaning agents for cleaning! Ask your CROSS dealer for an appropriate lubricant.

In the case of the rare forks with **elastomer suspension** the plastic springs should be cleaned and lubricated regularly with a non-corrosive resin-free grease. Some fork manufacturers supply special greases (h) for fork maintenance. Strictly observe the recommendations of the manufacturers.

Suspension forks with **air suspension** have to be checked regularly for pressure, as pressure escapes over time.

SAFETY INSTRUCTIONS

- ***Suspension elements are of sophisticated design. The maintenance work and above all the disassembly of the suspension elements are jobs best left to your CROSS dealer.***
- ***Have your CROSS EPAC/EAPC with suspension fork serviced once a year at least. Your CROSS dealer will send it in to a service centre of the fork manufacturer, if necessary.***

SUSPENSION SEAT POSTS

Suspension seat posts (a+b) enhance the cyclist's comfort when riding on uneven ground. They can be used on roads and field tracks.

The seat posts are usually designed for a cyclist of average weight, i.e. 75 kilograms. To manipulate the shock-absorbing properties ask your CROSS dealer to vary the spring preload and/or to replace the springs.

⚠ WARNING

Be sure not to pull out the seat post too far. The mark on the seat post (c) (end, min, max, stop, limit etc.) should always remain within the seat tube.

SAFETY INSTRUCTIONS

Seat post manufacturers normally provide instructions. Read them carefully before changing any settings or doing any maintenance work on your rear shock.

Check and Maintenance

Grasp the saddle at both ends and try to move it from side to side (d). That is how you can check the seat post for side-to-side play.

If you notice any play, have it checked and, if necessary, reduced by your CROSS dealer.

SAFETY INSTRUCTIONS

Have the seat post checked once a year by your CROSS dealer.

a

b

c

d

LIGHTING

For riding on public roads a functioning lighting set is obligatory (see chapter **"Legal Requirements for Riding on Public Roads"**). You should be familiar with the assembly of the lighting set so that you can repair possible failures yourself.

On CROSS EPACs/EAPCs the rear light (e) and the headlamp (f) are typically powered by the battery. They are connected with two cables each to the battery.

Rear Light

Bright LEDs beam through a (red) diffusion disc rearwards and are visible at best even from the side. Meanwhile, most rear lights provide a stand light function that is powered by a condensator or the battery when the CROSS EPAC/EAPC has to stop e.g. at a traffic light.

Front Headlamp

Modern lighting systems use several LEDs, i.e. light emitting diodes, beaming white light by means of a reflector and/or a diffusion disc on the road lane. Some models are equipped with a sensor that automatically switches on the headlamp when it gets dark. An additional feature of particularly high quality headlamps is a stand light function or even daytime running lights (both with LEDs).

Hub Dynamo

Hub dynamos rarely used on CROSS EPACs/EAPCs are built into the hub of the front wheel. They are virtually non-wearing and extremely effective. Some models are switched on electronically, some others mechanically. Hub dynamos are either switched on by a lever at the handlebar or directly at the headlamp. Other models offer the comfort of being switched on and off automatically by means of a sensor.

Battery-Powered Lighting

Inform yourself about the regulations in your country on the usage of battery-powered headlamps and rear lights instead of a dynamo lighting system. See also the chapter **"Legal Requirements for Riding on Public Roads"**.

⚠ WARNING

An incomplete or inoperative lighting set is not only against the law, it is also a hazard to your life. Cyclists riding in the dark without a light are liable to be overlooked and at risk of getting involved in serious accidents!

THINGS WORTH KNOWING ABOUT CROSS EPACS/EAPCS

Cycling Helmets and Glasses

Cycling helmets are highly recommended. Your CROSS dealer has a variety of styles and sizes (a).

Cycling helmets are only approved for use during cycling. Observe the manufacturer's instructions.

⚠ WARNING

Never ride without a helmet and glasses (b)! But remember that even the safest helmet is useless unless it fits properly and is correctly adjusted and fastened.

Apart from a cycling helmet and suitable clothing, cycling glasses (c) are absolutely essential when you set off on your CROSS EPAC/EAPC.

They do not only protect your eyes from the sun and the wind, but also keep out flies and other impurities that may impede your vision when they fly into your eyes. **Risk of accident!**

Your CROSS dealer has a wide range of cycling glasses available and will be pleased to advise you!

Clothing

⚠ WARNING

Never ride with wide-cut trousers or skirts that might get caught in the spokes, chain or chainrings. Be sure to use suitable clips or straps, if necessary.

Be sure to wear bright-coloured clothing to be seen by other road users! Reflecting material on the closing helps you to be seen better at dusk or in darkness.

Pedals and Shoes

Cycling shoes (d) should be made of solid material to provide firm support for your feet. In addition, they should have a stiff sole so that the pedal cannot press through. The sole should not be too wide; otherwise you will not be able to assume a natural foot position.

Special cycling shoes are obligatory if your CROSS EPAC/EAPC is equipped with clipless pedals. With these shoes small cleats are fixed to the sole. They give you a firm connection between shoe and pedal and allow an acceptable walking position.

The main advantage is that these cycling shoes and clipless pedals (e) prevent your feet from slipping off when pedalling fast or when riding over bumpy field and forest tracks. Due to the fix connection the pedal can either be pushed or pulled.

The usual way to engage with the pedal is that you bring it to the lowest position before you step on the horizontally positioned pedal body. Normally, the shoe engages with the pedal with a click which you will hear and feel clearly.

The release force of clipless pedals is adjusted by means of an Allen key (f). Creaking or squeaking noises can often be removed by applying some grease to the contact points. But they could also be signs of wear, just like a wobbling feeling. Check the cleats at regular intervals.

⚠ WARNING

- ***Make sure the fastening bolts of the cleats are always properly tightened. If they are loose, disengaging your shoe from the pedal is nearly impossible. Risk of accident!***
- ***Taking up the pedals, engaging and disengaging the shoes should first be practised at standstill (g). Later you can refine your technique in a place free of traffic.***

⚠ WARNING

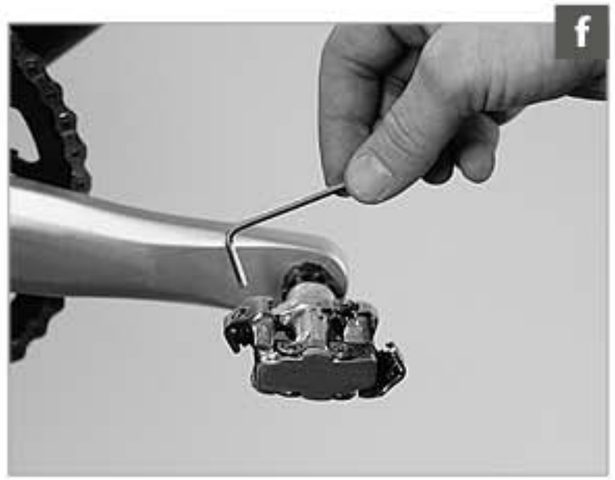
- ***Be sure to only use a pedal systems that allows you to engage and disengage smoothly. A defective pedal or a badly worn cleat can make the shoe disengage from the pedal. In some cases, it may be difficult or impossible to disengage. Risk of accident!***
- ***Make sure pedals and shoe soles are always free of dirt and other impurities (h) and lubricate the lock-in mechanism at regular intervals.***

SAFETY INSTRUCTIONS

- ***Read the operating instructions of the pedal manufacturer and ask your CROSS dealer to inform you about the different shoe models.***

e

f



g

h

Accessories

In purchasing this bicycle you laid the foundation for many years and miles of enjoyable cycling. Whatever you are planning to do with your bicycle, be sure to have proper equipment and to keep a few tips in mind. Your CROSS dealer has a variety of useful accessories on offer enhancing both your safety and convenience.

Your CROSS EPAC/EAPC can be equipped with various kinds of accessories (a). However, make sure that the requirements of the road vehicles regulations in your country, of the BS EN standard 15194 and of the guidelines for the parts replacement are observed. Any retrofitted part must be compatible with your CROSS EPAC/EAPC.

⚠ WARNING

Unsuitable accessories may change the properties of your CROSS EPAC/EAPC and even cause an accident. Therefore, always contact your CROSS dealer before mounting any accessories and strictly observe the notes on the intended use of the CROSS EPAC/EAPC and the notes in the "Guidelines for the parts replacement on CE marked e-bikes/EPACs/EAPCs with 250 watts and a pedal assist of up to 25 kmh (15.5 mph)".

Bicycle Locks

Do not forget to take a high quality D-, folding or chain lock (b) with you on your ride. The only way to effectively protect your CROSS EPAC/EAPC against theft is to lock it to an immovable object.

Puncture Kit

The most important accessories for a successful cycle tour are a tyre pump, a small tool kit and possibly your mobile phone. The tool kit should include two plastic tyre levers, the most commonly used Allen keys, an inner tube, a tyre repair kit, if necessary, and a little cash (c). In this way you will be well prepared in the event of a puncture or some other mishap.

SAFETY INSTRUCTIONS

- ***Retrofitted accessories, such as mudguards, pannier racks, etc. can impair the functioning of your CROSS EPAC/EAPC. Ask your CROSS dealer for advice before mounting any kind of accessories to your CROSS EPAC/EAPC.***
- ***Before buying any additional bells (d) or horns as well as lighting sets, inform yourself thoroughly whether these accessories are permitted and tested and accordingly approved for use on public roads. Make sure additional battery/accumulator-powered lamps are marked with the wavy line and the letter "K".***

a

b

c

d

TRANSPORTING LUGGAGE

There are various ways of carrying luggage on a CROSS EPAC/EAPC. The best way to transport luggage depends primarily on the weight and the volume of the luggage. An uncomplicated way of transporting luggage is in a specific bicycle rucksack (e). But for longer tours and bulky cargo your CROSS EPAC/EAPC may be equipped with a pannier rack (f).

It is recommended that you carry luggage in stable pannier bags (g) with the lowest possible centre of gravity. Be sure to load the pannier rack or bags evenly on both sides.

Another possibility of transporting luggage are handlebar bags. They often have snap buckles for quick mounting and removal. Handlebar bags are particularly suitable for valuables, the photographic equipment and maps that should be within easy reach during your tour.

When buying pannier bags, make sure they are watertight so that you will not have any unpleasant surprises after the first rain shower.

Bags designed to be mounted at the front, also referred to as lowrider bags, are attached to the fork with special holders. If you are in doubt or if you have any questions, contact your CROSS dealer.

⚠ WARNING

- ***Your CROSS EPAC/EAPC is designed for a maximum permissible overall weight including the rider, the luggage, the CROSS EPAC/EAPC and the child seat or trailer load, if permitted. The maximum permissible overall weight is specified on the type plate on the CROSS EPAC/EAPC or in the EPAC/EAPC card in these operating instructions. If you are in doubt, contact your CROSS dealer. Do not overload your CROSS EPAC/EAPC and also observe the permissible load capacity that may be imprinted or impressed on the pannier rack.***
- ***Adjust the suspension fork (h) and the tyre pressure to the additional load.***
- ***Luggage changes the riding characteristics of your CROSS EPAC/EAPC in general and increases your stopping distance! Therefore, practise riding a loaded CROSS EPAC/EAPC in a place free of traffic.***

e

f

g

h

TAKING CHILDREN WITH YOU

SAFETY INSTRUCTIONS

- *Not all CROSS EPACs/EAPCs are suitable for mounting child seats (a) with a special mounting device. Have a look at the EPAC/EAPC card and ask your CROSS dealer for advice.*
- *Prior to pulling a trailer (b) with your CROSS EPAC/EAPC check that it is designed for this purpose. Have a look at the EPAC/EAPC card or ask your CROSS dealer for advice.*

The only possible or permissible way of transporting children is in special child seats or trailers.

⚠ WARNING

- *Always secure your child(ren)/pet(s) with the seat belts, as uncontrolled movements can make the CROSS EPAC/EAPC or the trailer topple over.*
- *Note that your stopping distance increases due to the additional load of the child seat or trailer.*

a

b

⚠ WARNING

- *Make sure your child always wears a suitable helmet. A child seat or a trailer only provides insufficient protection in the event of an accident! Keep in mind that you always wear a helmet, as well.*
- *Only buy tested child seats and child trailers (tested e.g. to BS EN ISO standards) and have them properly mounted. Detailed information in this regard is provided in the manuals of the manufacturers that you have obtained with your purchase.*

Child Seats

⚠ CAUTION

- *Cover the springs of your saddle to make sure that your child will not have the fingers crushed.*

(Child) Trailers

With special child trailers that are towed behind a CROSS EPAC/EAPC you can transport one or two children.

Trailers affect the braking behaviour of your CROSS EPAC/EAPC and occupy far more width than the bicycle would alone. First, practise drawing the trailer without passengers. Equip the trailer with a long pole with coloured pennant to increase visibility. It should be equipped with all active and passive lights that are prescribed for riding on public roads in your country. As this depends on the type of trailer, inform yourself in the instructions of your trailer manufacturer.

⚠ WARNING

- *Prior to pulling a trailer with your CROSS EPAC/EAPC make sure before you set off it is equipped according to the regulations prescribed in your country and switch on the lighting as soon as darkness sets in or with poor visibility.*

Kids' Tandem Bicycles/Trailer Systems

There are different systems on the market (e+f) that allow a kids' bicycle to be attached to an adult bicycle to cycle together with your child on public roads.

Inform yourself at your CROSS dealer about the different types of kids' tandem bicycles.

These trailer systems also affect the braking behaviour of your CROSS EPAC/EAPC. Therefore, before riding with a kids' bicycle tandem on public roads, practise riding and brake behaviour without passengers in an area free of traffic!

SAFETY INSTRUCTIONS

- ***If you want to use your CROSS EPAC/EAPC for towing a trailer system, check whether it is approved for towing. Have a look at the EPAC/EAPC card or ask your CROSS dealer for advice.***

⚠ WARNING

- ***Trailer systems have a strong influence on the riding characteristics of your CROSS EPAC/EAPC. The weight of the hitched bicycle and the child make the ride relatively unstable. The CROSS EPAC/EAPC may tend to wobble. Practise getting on and off as well as cycling. Keep in mind, in particular when turning, that your CROSS EPAC/EAPC including trailer system is much longer.***
- ***It is also important for you to practise with your child how to behave on a hitched kids' bicycle during the ride. Make sure your child wears a helmet even when riding on a tandem bicycle. Set a good example by wearing a helmet, as well!***
- ***Only buy tested trailer systems (tested e.g. To BS EN ISO) and have them mounted correctly. The manuals of the manufacturers included in the delivery of your trailer system, provide detailed information in this regard.***
- ***When riding in the dark the attached kids' bicycle should be equipped with the prescribed lighting, i.e. the latter should be marked with a wavy line and the letter "K" (g). For more information see the chapter "Legal requirements for riding on public roads". If the bottle dynamo's roller does not spin, we recommend a tested battery-powered rear light (h).***

e

f

g

h

TRANSPORTING THE CROSS EPAC/EAPC

By Car

CROSS EPACs/EAPCs can be transported like conventional bicycles outside or inside the car. Always make sure the CROSS EPAC/EAPC is securely fastened outside or inside the car and check the fastenings regularly. In addition, you should always remove the battery from the CROSS EPAC/EAPC (a), if possible, prior to fastening the CROSS EPAC/EAPC on the car roof. Stow the battery in its original cardboard box (from the CROSS dealer) and, if mounted, the removable display unit inside the car and secure it appropriately to avoid any damage during transport. Also dismount accessories, such as a tyre pump, panniers, etc.

Nearly every car accessory dealer and car company offers carrier systems (b) that allow the transport of the CROSS EPAC/EAPC without disassembly.

The CROSS EPACs/EAPCs are usually placed in a rail and fastened with a clamp (c) gripping the down or the top tube or the seat post. This may result in irreparable damage to the frame.

High-end, very thin-walled aluminium or carbon frames are particularly susceptible to such kind of damage. Due to the material properties of carbon, you may not see a severe damage at first sight. This can result in an unforeseeable severe accident at a later date. There are, however, specific suitable models available in the car accessory trade.

Rear carriers (d) are becoming more and more popular. Their big advantage over roof or boot-mounted carriers is that you do not have to lift up the CROSS EPAC/EAPC so high. Make sure the clamps do not cause any damage to the fork or frame. **Risk of breakage!**

Whatever system you opt for, make sure it complies with the relevant safety standards of your country!

Read the operating instructions of your bicycle carrier and comply with the maximum load capacity and recommended or prescribed driving speed. Observe the necessary drawbar load, if available.

⚠ WARNING

- *Make sure to remove all parts of your CROSS EPAC/EAPC (tools, pannier bags (e), child seats (f) etc.) which might come loose during transport. Risk of accident!*
- *Do not buy a carrier on which the CROSS EPAC/EAPC has to be mounted upside down, i.e. with the handlebar and saddle fixed face down to the carrier. This way of fastening the bicycle exposes handlebar, stem, saddle and seat post to extreme stress during transport. Do not opt for a carrier system with crank arm fit. Risk of breakage!*
- *Check whether your CROSS EPAC/EAPC is properly fastened before and at regular intervals during the ride. An EPAC/EAPC that detaches from the roof carrier may endanger other road users.*
- *Always secure the CROSS EPAC/EAPC or parts of it when putting it/them into the interior of your car. Parts shifting around can endanger your safety.*
- *Make sure the lights and the number plate of your car are not hidden from view. For some carriers, a second exterior rear view mirror is required by the road traffic regulations.*

⚠ WARNING

- *Pull the brake levers and secure them with a strong elastic band (g), when transporting a CROSS EPAC/EAPC with hydraulic disc brakes horizontally or hanging.*

⚠ CAUTION

- *The weight or the weight distribution on EPACs/EAPCs differs significantly from that on bicycles without drive system. A CROSS EPAC/EAPC is clearly heavier than a bicycle without drive system. For this reason parking, pushing, lifting and carrying the CROSS EPAC/EAPC is more difficult. Bear this in mind when loading your CROSS EPAC/EAPC into a car and unloading it or when mounting it on a bicycle carrier system.*

NOTICE

- *Most clamps are a potential source of damage to large-diameter frame tubes that are not designed to be fixed in such clamps! Do not use such systems with carbon frames.*
- *If your bicycle has disc brakes, be sure to mount the safety locks (h) before transporting the CROSS EPAC/EAPC with the wheels dismounted.*

e

f

g

h

NOTICE

- *Secure the bicycles on the bicycle carrier with an additional lock (a) e.g. during a halt.*
- *Bear in mind that your car may have a greater height or a larger width. You may measure the overall height and place a sign stating the height somewhere in the cockpit or on the steering wheel so that it can be easily seen.*
- *Before transporting several CROSS EPACs/EAPCs with a roof-mounted or boot-mounted carrier system, inform yourself about the maximum load capacity of the bicycle carrier. Keep in mind that the weight of a CROSS EPAC/EAPC is higher than the weight of a bicycle without drive system. It could be that you are only allowed to transport one or two CROSS EPACs/EAPCs instead of three bicycles without drive system.*
- *Make sure to remove all movable and loose parts and above all the rechargeable battery (b), the control element and the cycle computer (c) on the handlebar before transporting the CROSS EPAC/EAPC inside or outside the car. When transporting your CROSS EPAC/EAPC without battery on a bike carrier system, protect the connections against water, moisture and dirt, e.g. with a plastic bag (d).*

SAFETY INSTRUCTIONS

- *If necessary, inform yourself about the laws and regulations concerning bicycle/EPAC/EAPC transport in the countries that you intend to transit during your journey. The laws and regulations differ, e.g. with regard to the marking.*

a

b

c

d

By Train / By Public Transport

CROSS EPACs/EAPCs can be transported like conventional bicycles by public transport.

Taking an EPAC/EAPC with you by public transport is basically permitted, the regulations applicable in the cities may differ, however. There are e.g. some places where you are only allowed to travel with your CROSS EPAC/EAPC during off-peak hours and with an additional bicycle ticket. Inform yourself in time about the regulations of carrying the bicycle before you start the trip!

In some countries regional trains have special spaces for the storage of EPACs/EAPCs and other things. This is an option to take your CROSS EPAC/EAPC with you. They are often at the front or end of a train and marked with a bicycle sign.

When taking a high-speed train check whether you can take your CROSS EPAC/EAPC or bicycle with you.

⚠ CAUTION

If the rechargeable battery of your CROSS EPAC/EAPC is mounted to the down tube or to the pannier rack (e), you can remove the battery for an easier boarding and disembarking (f).

Remove, if necessary, heavy or bulky pannier bags and luggage for an easier boarding and disembarking of the train.

SAFETY INSTRUCTIONS

Before you start your journey inform yourself in time about the transport conditions and also observe the regulations and rules for bicycle transport in the countries through which you travel during your journey.

By Plane

If you intend to take your CROSS EPAC/EAPC by plane or to dispatch it by a forwarding agent, you have to observe particular packing and labelling requirements for rechargeable batteries which are considered as hazardous goods. Contact the airline, an expert for hazardous items or the forwarding agent in time.

SAFETY INSTRUCTIONS

Contact the airline with which you intend to travel in time and inform yourself about conditions and possibilities of taking your CROSS EPAC/EAPC with you.

GENERAL NOTES ON CARE AND SERVICING

Service and Maintenance

Your CROSS dealer will have assembled and adjusted your CROSS EPAC/EAPC ready for use when you come to collect it. Nevertheless, your CROSS EPAC/EAPC needs regular servicing (a). Have your local CROSS dealer do the scheduled maintenance work. This is the only way to ensure the durable functioning of all components.

The bicycle will be due for a first inspection after 100 to 300 kilometres (60 to 180 miles) or 5 to 15 hours of initial use and/or four to six weeks. The CROSS EPAC/EAPC must be serviced, because in this initial "break-in" period of use, safety-relevant bolted connections and spokes can slightly lose tension or gears may go out of adjustment. This "break-in" period is unavoidable.

Therefore, remember to make an appointment with your CROSS dealer for the first inspection of your new CROSS EPAC/EAPC. The first service is very important for both functioning and durability of your CROSS EPAC/EAPC.

⚠ CAUTION

Remove the rechargeable battery (b) or the display before doing any work on your CROSS EPAC/EAPC (e.g. servicing, repairs, assembly, maintenance, work on your drive system, etc.). Activating the drive system unintentionally bears the risk of injury!

NOTICE

Keep in mind that the battery of your CROSS EPAC/EAPC shows signs of wear over the years. This results in a continuous reduction of the battery's capacity and in a reduced range compared to its state as new (c). After a certain period of time the battery even needs to be replaced.

Keep in mind that the auxiliary drive may lead to partly higher wear than you are used to. This applies in particular to the brakes and the tyres and in the case of mid-mounted motors/drive units to the chain (d) and the sprockets.

Internal gear hubs must be maintained regularly. Observe the intervals in the chapter "Service and Maintenance Schedule".

The intended use of the CROSS EPAC/EAPC includes regular servicing and the replacement of worn out parts in time, e.g. chains, brake pads or shift and brake cables, and therefore has an influence on the warranty and the guarantee, as well.

After the "break-in" period you should have your CROSS EPAC/EAPC serviced regularly by your CROSS dealer. If you ride often on poor road surfaces and with adverse weather conditions, the time between the service intervals (e) will shorten according to the harder use. The off-season during the winter months is a very good time to take your CROSS EPAC/EAPC to your CROSS dealer for the strongly recommended, comprehensive annual inspection, as they will have plenty of time for you and your CROSS EPAC/EAPC.

If in case of a repair no original spare parts are available, observe the **"Guidelines for the parts replacement on CE marked e-bikes/ EPACs/EAPCs with 250 watts and a pedal assist of up to 25 kmh (15.5 mph)"** (f). You find it in the chapter **"Guidelines"**. In case of inquiries contact your CROSS dealer.

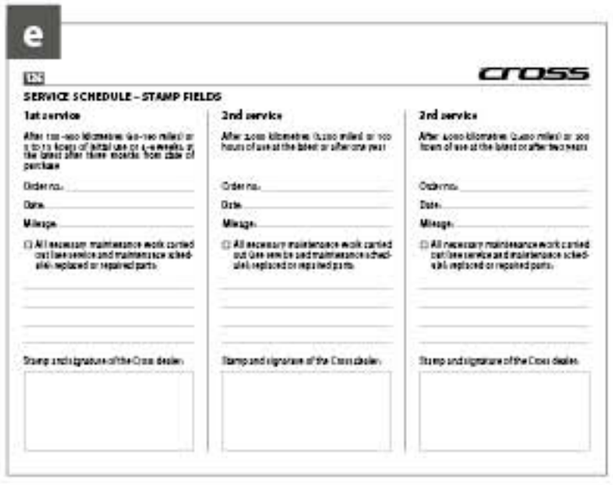
Note that the components of your **speed pedelec** (g) must be replaced by original spare parts only to grant type approval and provide insurance cover. In case of inquiries contact your CROSS dealer.

If in case of a repair no original spare parts are available, observe the **"Guidelines for the parts replacement on speed pedelecs with type or individual approval with a pedal assist of up to 45 kmh (28 mph)"** (h). You find it in the chapter **"Guidelines"**. In case of inquiries contact your CROSS dealer.

⚠ WARNING

Servicing and repairs are jobs best left to your CROSS dealer. If the inspections are not performed or performed unprofessionally, this can result in the failure of parts of your CROSS EPAC/EAPC/speed pedelec. Risk of accident! When working on your CROSS EPAC/EAPC, restrict yourself to jobs for which you have the necessary knowledge and suitable tools, e.g. a torque wrench including bits.

e


SERVICE SCHEDULE – STAMP FIELDS

1st service

2nd service

2nd service

f


Guidelines for the parts replacement on CE marked e-bikes / EPACs / EAPCs with 250 watts and a pedal assist of up to 25 kmh (15.5 mph)

g

h


Guidelines for the parts replacement on speed pedelecs with type or individual approval with a pedal assist of up to 45 kmh (28 mph)

⚠ WARNING

- *If a component needs to be replaced, make it a rule to only use original spare parts. Wearing parts of other manufacturers, e.g. brake pads (a) or tyres that are not of identical size, may cause harm to the safety of your CROSS EPAC/EAPC. Risk of accident! In the case of CROSS EPACs/EAPCs both the CE mark and the warranty become void, in the case of speed pedelecs the operating licence expires if parts are not replaced by the original spare parts.*
- *Do not place your CROSS EPAC/EAPC upside down in general (b). When turning the CROSS EPAC/EAPC upside down the add-on parts, in particular those of the handlebar, may sustain damage. This can render the brakes ineffective!*

⚠ CAUTION

- *Do not touch in or on rotating wheels or disc brakes during the ride or servicing. Risk of injury!*
- *Do not reach between chain and cassette sprockets during servicing and repair work of the chain and the sprockets with the chainguard removed. Risk of injury!*

NOTICE

- *A rechargeable battery that has reached the end of its service life must not be disposed of with normal household rubbish (c). Bring the rechargeable battery instead to the dealer, where you buy your new one. For more information see the system instructions of the drive system manufacturer. Ask your CROSS dealer for advice.*

SAFETY INSTRUCTIONS

- *If in case of a repair no original spare parts are available, observe the "Guidelines for the parts replacement on CE marked e-bikes/EPACs/EAPCs with 250 watts and a pedal assist of up to 25 kmh (15.5 mph)" and the "Guidelines for the parts replacement on speed pedelecs with type or individual approval with a pedal assist of up to 45 kmh (28 mph)" (d) in the chapter "Guidelines".*
- *For your own safety, bring your newly bought CROSS EPAC/EAPC to your CROSS dealer for its first inspection after 100 to 300 kilometres (60 to 180 miles), or 5 to 15 hours of initial use or after four to six weeks, at the very latest, however, after three months.*
- *Note and follow the instructions given in the chapters on service and maintenance of the system instructions of the drive system manufacturer.*

a

b

c

d

Guidelines for the parts replacement on speed pedelecs with type or individual approval with a pedal assist of up to 45 kmh (28 mph)

Cleaning and Caring for the CROSS EPAC/EAPC

Dried sweat, dirt and salt from riding during the winter or in sea air can harm your CROSS EPAC/EAPC. You should therefore make it a habit of cleaning all components at regular intervals.

Avoid cleaning your CROSS EPAC/EAPC with a pressure water washer (e). The high-pressure water ejected in a narrowly focused jet may pass through seals and penetrate bearings. This leads to the dilution of lubricants and consequently to greater friction. This destroys and impairs the functioning of the bearing races in the long term. Pressurised water also tends to abrade frame stickers.

A much more gentle way of cleaning your CROSS EPAC/EAPC is with a low pressure water jet or a bucket of water and a sponge or a large brush. Cleaning your CROSS EPAC/EAPC by hand has another positive side-effect: you may discover defects in the paint (f) as well as worn or defective components at an early stage.

Inspect the chain after you have finished cleaning and oil it, if necessary (g) (see the chapter **"Chain – Care and Wear"**).

Apply a coat of standard hard wax on painted, metal and carbon surfaces (except from brake sufaces). Polish the waxed surfaces after drying to give them a nice shine.

⚠ WARNING

While cleaning, watch out for cracks, scratches, dents as well as bent or discoloured material. Have defective components replaced immediately and touch up paint defects. If you are in doubt or if you have any questions, contact your CROSS dealer.

Keep cleaning agents and chain oil clear of the brake pads, brake discs/rotors and rim sides (brake surfaces). This could render the brake ineffective (see the chapter "Brake System")! Never grease or lubricate the clamping areas of a frame made of carbon (h), e.g. handlebar, stem, seat post and seat tube. Once greased carbon fibre components may never again be clamped reliably!

The individual components of the drive system can be cleaned with a soft cloth and commercial neutral detergents or moistened with water, but do not use excessive water. The drive is not approved for steam cleaning, high-pressure cleaning or cleaning with a water hose. The penetration of water into the electrics or the drive system can destroy the devices. Risk of explosion!

NOTICE

Only use petroleum based solvents for cleaning tough oil or grease stains from paint and carbon surfaces. Never use degreasing agents containing acetone, methyl chloride or the like, or solvent-containing, non-neutral or chemical cleaning agents that could attack the surface!

e

f

g

h

SERVICE AND MAINTENANCE SCHEDULE

You should have your CROSS EPAC/EAPC serviced regularly after the initial "break-in" period of use. The schedule given in the table below is a rough guide for cyclists who ride between 1,000 and 2,000 km (600 and 1,200 miles) or 50 to 100 hours of use a year. If you consistently ride more or if you ride a great deal on poor road surfaces, the maintenance periods will shorten accordingly.

Component	What to do	Before Every Ride	Monthly	Annually	Other intervals
Lighting	Check function	■			
Tyres	Check pressure	■			
	Check tread and side walls		■		
Brakes (rim brakes)	Check lever travel, thickness of brake pads and position relative to rim, if necessary; brake test in standing	■			
Brakes (drum/roller)	Lever travel, test brakes in standing	■			
Brakes, brake pads (rim brakes)	Clean		■		
Brake cables, pads, hoses	Visual inspection		■		
Brakes (disc brakes)	Check lever travel, brake pad thickness, for leaks, test brakes in standing	■			
	Replace brake liquid (DOT-liquids)			✕	
Suspension fork	Check bolts			✕	
	All-inclusive service (change oil or grease elastomers)			✕	
Rims (of rim brakes)	Check thickness, replace if necessary				✕ After 2nd set of brake pads at the latest
Fork (rigid)	Check and replace, if necessary				✕ At least every two years
Suspension seat post	Service			✕	
Multi-speed hub/ internal gear hub	8-speed internal gear hub: oil gear			✕	
	11-speed internal gear hub: change gear oil				✕ After the first 1,000 km (600 miles) or after 1 year, then every 5,000 km (3,000 miles)
	Check for play			✕	
Bottom bracket	Check for bearing play		■		
	Dismount and regrease (cups)			✕	

Component	What to do	Before Every Ride	Monthly	Annually	Other intervals
Motor shaft with mid-mounted motors, bottom bracket	Check for bearing play		■		
	Dismount and regrease (cups) only bottom bracket with rear wheel motors			✕	
Chain	Check and grease, if necessary	■			
	Check wear, replace, if necessary Derailleur gears				✕ After 1,000 km (600 miles) or 50 hours of use
Crank	Check or retighten, (with a torque wrench)		■		
Painted/anodized/carbon	Polish				■ At least every 6 months
Wheels/spokes	Check for trueness and tension		■		
	True or retension				✕ If necessary
Handlebar and stem (aluminium and carbon)	Check and replace, if necessary				✕ Every 2 years at the latest
Headset	Check for bearing play		■		
	Regrease			✕	
Metal surfaces	Polish (except rim sides of rim brakes, rotors)				■ At least every 6 months
Hubs	Check for bearing play		■		
	Regrease			✕	
Pedals (all)	Check for bearing play		■		
Pedals (clipless)	Clean and grease locking mechanism		■		
Seat post/stem	Check bolts		■		
	Disassemble and regrease Carbon: new assembly paste (no grease!)			✕	
Front/rear derailleur	Clean and grease		■		
Quick-release/thru axle	Check seat	■			
Bolts and nuts	Check or retighten, (with a torque wrench)		■		
Valves	Check seat	■			
Cables gears/brakes	Dismount and regrease			✕	

If you have a certain degree of mechanical skills, experience and suitable tools, such as a torque wrench, you should be able to do the checks marked ■ by yourself. If you come across any defects, take appropriate measures without delay. If you are in doubt or if you have any questions, contact your CROSS dealer.

Jobs marked ✕ are best left to your CROSS dealer.

RECOMMENDED TORQUE VALUES

All bolted connections of the components have to be tightened carefully and checked regularly to ensure the safe and reliable operation of the CROSS EPAC/EAPC. This is best done with a torque wrench that disengages as soon as the desired torque value is reached or a click-type torque wrench.

Tighten carefully by approaching the prescribed maximum torque value in small steps (0.5 Nm increments) and check in between the proper fit of the component. Never exceed the maximum torque value indicated by the manufacturer!

Where no maximum torque value is given start with 2 Nm. Observe the indicated values and follow the possibly enclosed manuals of the component manufacturers.

⚠ WARNING

Always use a torque wrench and do not exceed the maximum torque values! You find the torque values on the components themselves, in the chapter "Recommended Torque Values" or in the possibly enclosed instructions of the component manufacturers. Alternatively, you find them in the download area on the websites of the respective component manufacturers.

Component	Manufacturer	Type	Fixing bolt	Cable clamp	Pulleys
Rear derailleur	Shimano	all	8–10	6–7	2.5–5
	SRAM	Single (Apex mech.)	10–12	4–5	
		Single (Eagle, also AXS)	11	4–5	
		Single (Eagle Transmission)	35		3
		Single (Road AXS / XPLR AXS)	5		
		Double (Road AXS)	5		

Component	Manufacturer	Type	Axle nut/bolt	Clamp torque support	Di2 motor unit, axle plate
Internal gear hub	Enviolo	Urban, City, Trekking, Heavy Duty (135 mm)	30–40		
		Heavy Duty (148 mm)	10–15		
	Rohloff	E14, SPEEDHUB 500/14 – quick-release	up to 7		3
		E14, SPEEDHUB 500/14 TS – threaded axle	30–35		3
		E14, SPEEDHUB 500/14 A-12 – thru axle	15–20 Nm		3
	Shimano	Nexus, Alfine	30–45	2–3	6–10

Component	Manufacturer	Type	Fixing bolt/ nut/bolt	Fixing bolt lever (2 pieces)	Adjusting bolt I-Spec
Shifter/ control unit	Enviolo	AUTOMATIQ controller	1		
		Manual controller	2–2.5		
	Rohloff	E-14 shifter unit	1		
		Twist shifter	2		

Component	Manufacturer	Type	Fixing bolt/ nut/bolt	Fixing bolt lever (2 pieces)	Adjusting bolt I-Spec
Shifter/ control unit	Shimano	Straight handlebar – Sora (R3000) / Claris (R2000)	3–5		
		Straight handlebar – Tiagra (4700)	3		
		XTR / Deore XT / SLX / Deore / Cues (U8000)	3		
		Alivio / Acera / Altus / Cues (U6000)	5		
		Tourney	2.5		
		I-Spec Adapter	4–6		
		I-Spec adjusting bolt	3 (4 – M9100)		
		STePS – SW-M8150	3	2	3
		STePS – SW-E8000-L	2–2.2	0.5-0.7	
		STePS – SW-EN600-L/-R	0.8		
		STePS – SW-EM800-L / SW-E7000 / SW-E6010 / SW-E6000	1.5		
	SRAM	Discrete / Infinity Clamp	2		
		Discrete Clamp AXS	2 / 3 / 2		
		MatchMaker X – adapter	3		
		MatchMaker X – clamp	5.5		
		MatchMaker X – Pod Controller	2 / 2		
		Split clamp / MatchMaker – adapter	2		
		Split clamp / MatchMaker – clamp	3		
		Single bolt clamp	3 / 4		

Component	Manufacturer	Type	Fixing bolt (clamp)	Fixing screw housing	Fixing bolt housing
Display	Shimano	STePS- SC-EM800 / SC-E8000 / SC-E7000 / SC-EN500 / SC-E5003 / SC-E5000	0.8		0.6
		STePS – SC-EN600	0.8	0.6	

Component	Manufacturer	Type	Fixing bolt motor block	Fixing bolt cover	Fixing bolt light cable
Motor/ drive unit	Shimano	STePS (reference value – observe the frame manufacturer's specification)	10–12.5	0.6	0.6

Component	Manufacturer	Type	(Crank) fixing bolts	Fixing screws	Integration cap
Crankset	Shimano	Shimano (all)	0.7–1.5	12–14	
		Shimano (FC-E5000 / FC-E5010)	35		
	SRAM	Bosch / Brose	54		0.4
	Miranda	Bosch (Gen4 / Gen3)	57–64		
		Shimano (EP8 / E8000 / E7000 / E6100)	2–3	10–14	
		Yamaha (PW-X / PW-X2 / PW-ST)	47–54		

Component	Manufacturer	Type	Fixing bolts/lock ring
Crank spider	Shimano	Shimano (all)	35–45
	SRAM	Bosch / Brose	30
	Miranda	Bosch (Gen4 / Gen3)	25–30
		Shimano (EP8 / E8000 / E7000 / E6100)	35–45
		Yamaha (PW-X / PW-X2 / PW-ST)	40

Component	Manufacturer	Type	Chainring bolt	Fixing bolt chainguard	Fixing bolt crank arm cover
Chainring	Shimano	Shimano (all)	12–14	0.7	0.8
	SRAM	Bosch / Brose – see crank spider			
	Miranda	Bosch (Gen4 / Gen3)	10–12		
		Shimano (EP8 / E8000 / E7000 / E6100)	10–12		
		Yamaha (PW-X / PW-X2 / PW-ST)	9–11.5		

Component	Manufacturer	Type	Lock/safety ring
Cassette sprockets	Shimano	HG / Microspline	40
	SRAM	XDR / XD	40
		Splined non-XD	40

Component	Manufacturer	Category	Type	Fixing bolt
Charging port external	Shimano	STePS	all	0.6

Component	Manufacturer	Category	Type	Fixing bolt
On/off switch	Shimano	STePS	all	5–6

Component	Manufacturer	Category	Type	Fixing bolt	Fixing bolt magnet
Speed sensor	Shimano	STePS	EW-SS300 / SM-DUE10	1.5–2	1.5–2
		STePS	EW-SS301 / SM-DUE11	0.6	1.5–2
		STePS	EW-SS302	0.8–1.3	1.5–2

Component	Manufacturer	Type	Fixing bolt/nut	Cable clamp	Bleeder screw/valve
Brake calliper	Magura	Disc – calliper, adapter (PM / IS2000)	6		4
		HS – easy mount – adapter bolt – 2 pcs. – top	6		4
		HS – easy mount – socket screw – bottom left – top view	4		4
		HS – easy mount – with brake booster adapter bolt top right – top view	4		4
		HS – EVO 2 – adapter bolt – 2 pcs. – top	6		4
		HS – EVO 2 – socket screw – bottom left – top view	6		4
		HS – EVO 2 – with brake booster adapter bolt top right – top view	6		4
		HS – socket screw– quick-release (closed)	4.5		4
	Shimano	Disc – post mount / flat mount	6–8		
		Dura Ace – Tiagra			4–7
		XTR – Deore, Saint, ZEE, Cues, group-free			4–6
		Roller brake	20–25	6–8	
		Back-pedal brake (clamp torque support)	2–3		
	SRAM	Disc – flat mount	5		1.6
		Disc – post mount	6		1.6
		Disc mech. – post mount / IS2000	9.5 (9–10)	8–10	
	Tektro	Disc – IS2000 adapter	6–8		
		Disc – post mount	6–8		6–8
		Disc (mech) – flat mount – front	5–7	6–8	6–8
		Disc – flat mount – rear – adapter	5–7		
		Disc – flat mount – rear	6–8		6–8

Component	Manufacturer	Type	Fixing bolt/nut	Safety bolt disc
Brake pad	Magura	Disc		2.5
	Shimano	Disc – slot		0.2–0.4
		Disc – hexagon socket		2–4
	SRAM	Disc – hexagon socket		1.1
	Tektro	Disc – hexagon socket		0.8–1.2

Component	Manufacturer	Type	Fixing bolt (clamp)	Bleeder screw/valve/ adjusting bolt
Brake lever	Magura	Disc / HS	4	0.5
	Shimano	Disc	4–6	0.5–1.0
		Disc – (Tiagra 4700)	6–8	0.5–0.7
	SRAM	Disc	4–5	1.6
		Split clamp / MatchMaker X clamp	5.5	
		Split clamp / MatchMaker – clamp / single bolt clamp	3	

Component	Manufacturer	Type	Union nut/screw	(Banjo) connector fixing bolt
Brake hose	Magura	Disc – brake lever	4	
		Disc – brake calliper – (RHR)		3
		HS	4	
	Shimano	Disc – brake lever – (flat mount)	5–6	
		Disc – brake lever – (post mount)	5–7	
		Disc – brake calliper – (flat mount / post mount)	5–6/7	
		Disc – brake calliper		depending on model
	SRAM	Disc – brake lever	8	
		Disc – brake calliper – (flat mount / post mount)	5–6	
		Disc – brake calliper – (post mount) – Torx		5
		Disc – brake calliper – (post mount) – outside hex		10.8
		Disc – brake calliper – (post mount) – inside hex		9.3
	Tektro	Disc – brake lever	5–7	
		Disc – brake calliper		6–8

Component	Manufacturer	Type	Lock nut/ disc	Fixing bolts
Brake disc/ rotor	Magura	6-hole		4
	Rohloff	4-hole		10
	Shimano	Center Lock	40	
		6-hole / 5-hole		2–4
	SRAM	Center Lock	40	
		6-hole		6.2
	Tektro	6-hole		4–6

Component	Manufacturer	Type	Pedal axle
Pedals	Shimano		35–55
	SRAM	Crank – non-DUB	47–54
		Crank – DUB	54

Component	Manufacturer	Type	Fixing bolt
Shoes	Shimano	Cleat	5–6

Do not apply these torque values to the components from other manufacturers. Also observe the values in any enclosed instructions from the component manufacturers.

www.magura.com
www.rohloff.de/en
https://si.shimano.com
www.sram.com
www.tektro.com
https://enviolo.com
https://mirandabikestore.com

Sheltering and Storing the CROSS EPAC/EAPC

If you regularly service your CROSS EPAC/EAPC during the year, you will not need to take any special precautions when storing it for a short time, apart from securing it against theft. It is advisable to store the bicycle in a dry and airy place.

There are some things to bear in mind, when putting the CROSS EPAC/EAPC away for the winter: Inflated tubes tend to gradually lose air when the bicycle is not used for a long time. If the CROSS EPAC/EAPC is left standing on flat tyres for a long time, the tyre structure can suffer from damage. It is therefore better to hang the wheels or the entire CROSS EPAC/EAPC or to check the tyre pressure regularly (a).

Clean the CROSS EPAC/EAPC (b) and protect it against corrosion. Your CROSS dealer offers a variety of care products, such as spray wax etc. (c).

Dismount the seat post and let dry away possibly penetrated humidity. Spray atomized oil into the seat tube exclusively in the case of metal frames. Shift the gear to the smallest chainring and the smallest sprocket (d). This relaxes both cables and springs.

SAFETY INSTRUCTIONS

There is usually hardly any waiting time at your CROSS dealer during the winter months. In addition, many dealers offer annual checks at a special price. Use the off-season to take your CROSS EPAC/EAPC to your CROSS dealer for inspection!

a

b

c

d

GUIDELINES

Guidelines for the parts replacement on CE marked e-bikes/EPACs/EAPCs with 250 watts and a pedal assist of up to 25 kmh (15.5 mph)

CATEGORY 1

Parts that may only be replaced after the vehicle manufacturer/system provider has given approval

> Motor

> Sensors

> Electronic control unit

> Electric cables

> Control unit on the handlebar

> Display

> Battery pack

> Charger

Parts that may only be replaced the vehicle manufacturer has given approval

> Frame

> Rear shock

> Rigid and suspension fork

> Wheel for hub motor

> Brake system

> Brake pads (rim brakes)

> **Luggage carrier** (Luggage carriers directly affect the load distribution on the bicycle. Both negative and positive modifications potentially result in a riding behaviour that differs from that implied by the manufacturer)

Translation and layout: Zedler-Institut
www.zedler.de
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CATEGORY 2

Parts that may be replaced after the vehicle or parts manufacturer has given approval*

> **Crank arms** (Provided that both the length (centre of axle mount – centre of pedal thread) as well as the distance crank arms – frame centre (Q-factor) are observed)

> **Wheel without hub motor** (Provided that the ETRTO is observed)

> **Chain / Toothed belt** (Provided that the original width is observed)

> **Rim tape** (Rim tapes and rims must be compatible. Modified combinations may result in rim tape shifting and thus in defective inner tubes)

> **Tyres** (The stronger acceleration, the additional weight and the more dynamic cornering require the use of tyres approved for e-bike use. In this respect, observance of the ETRTO is essential)

> **Brake cables / Brake hoses**

> **Brake pads** (Disc, roller, drum brakes)

> **Handlebar-stem unit** (Provided that there is no need of changing the lengths of cables and/or hoses. A modification of the seating position for the benefit of the consumer should be possible within the original cable lengths. A modification beyond results in a significantly changed load distribution on the bicycle and may potentially lead to critical steering properties)

> **Saddle and seat post unit** (Provided that the offset to the rear does not exceed 20 mm with regard to the series / original field of use. In the case of a suspension seat post this applies when the cyclist adopts the typical riding position. In this case, as well, a modified load distribution beyond the intended adjustment range may lead to critical steering properties. The length of the saddle rails at the saddle frame as well as the saddle form are also an issue)

> **Headlights** (Headlights are designed for a specific voltage which must be compatible with the rechargeable battery of the vehicles. In addition, the electromagnetic compatibility (EMC) must be ensured whereas the headlight may be responsible for a part of the potential disturbance)

*** Note: Approval can only be given by the component manufacturer, if the component was tested sufficiently according to its intended use and the respective standards in advance and if a risk analysis was made.**

CATEGORY 3

Parts that do not require specific approval

> **Headset**

> **Bottom bracket**

> **Pedals** (Provided that the pedal is not wider than the series / original pedal)

> **Front derailleur**

> **Rear derailleur** (All gear change parts must be suitable for the number of gears and compatible with one another)

> **Shifters / Twist grip**

> **Cables and housings**

> **Chainwheels / Belt sprockets / Cassette sprockets** (Provided that the number of teeth and the diameter is identical to the series/original field of use)

> **Chainguard**

> **Mudguards** (Provided that the width is not smaller than that of the series/original parts and the dearance to the tyre is 10 mm at least)

> **Spokes**

> **Inner tube of identical design and with identical valve**

> **Dynamo**

> **Battery/rechargeable battery-operated headlights** Only, if provided with a K-number)

> **Rear light** (Dynamo-operated or powered by rechargeable e-bike battery)

> **Reflector**

> **Spoke reflector**

> **Kickstand**

> **Grips with screw clamps**

> **Bell**

CATEGORY 4

Special notes for mounting accessories

> **Bar ends are permissible, provided that they are mounted appropriately towards the front** (The load distribution must not be modified severely)

> **Rear-view mirrors are permissible.**

> **In Germany, additional battery/rechargeable battery-operated headlights with K-number (test certificate) are permissible according to section 67 of the German road traffic licensing regulations. (Inform yourself about the legislation in your country).**

> **Trailers are only permissible after approval by the vehicle manufacturer.**

> **Child seats are only permissible after approval by the vehicle manufacturer.**

> **Front baskets are to be considered critical due to the undefined load distribution. Permissible after approval by the vehicle manufacturer only.**

> **Pannier bags and top cases are permissible. The permissible total weight, the maximum loading of the luggage carrier and a correct load distribution have to be observed.**

> **Permanently mounted weather protection devices are only permissible after approval by the vehicle manufacturer.**

> **Front and rear luggage carriers are only permissible after approval by the vehicle manufacturer.**

This is the translation of the original guidelines issued by ZIV, VSF, BIV (German umbrella organisation for the German cycle industry guilds) and velotech.de in cooperation with Zedler-Institut, updated in 2023. In the event of any misunderstandings, the original German version (Leitfaden für den Bauteiletausch bei CE-gekennzeichneten E-Bikes/Pedelecs mit 250 Watt und einer Tretunterstützung bis 25 km/h) shall be applicable.

Experts of the following associations/companies were involved in drawing up the present guidelines (in alphabetic order):

Zweiradmechaniker-Handwerk · velotech.de · VSF · zedler-Institut Technology and Passion for Bicycles · ZIV

Guidelines for the parts replacement on speed pedelecs with type or individual approval with a pedal assist of up to 45 kmh (28 mph)

CATEGORY 1	CATEGORY 2	CATEGORY 3	CATEGORY 4
Important basic information	**Parts that may only be replaced upon presentation of a valid test report (parts approval (ABE, EC, ECE) or part certificate*)**	**Parts that may be replaced in consideration of the conditions described further below**	**Special notes for mounting accessories**
> Fast e-bikes with a motor assistance of up to 45 kmh (28 mph) are considered motor vehicles and subject to the EU Directive 2002/24/EC or the EU Regulation No. 168/2013. > Depending on the vehicle there may be different requirements which must be strictly observed when replacing a component. Therefore, always check the indications given in the vehicle documents prior to doing any work on the vehicles. > Note: At present, vehicles with an individual type approval are mainly subject to the regulations of the EU Directive 2002/24/EC. > All parts that are not included in the list must only be replaced by original spare parts of the vehicle and/or component manufacturer	> **Brake systems** > **Brake discs / Brake hoses / Brake pads** (With valid type approval acc. to ECE-R 90 or general operating licence only) > **Handlebar-stem unit** (Provided that there is no need of changing the lengths of cables and/or hoses. A modification of the seating position for the benefit of the consumer should be possible within the original cable lengths. A modification beyond results in a significantly changed load distribution on the bicycle and may potentially lead to critical steering properties) > **Seat post** (Provided that the offset to the rear does not exceed 20 mm with regard to the series/original field of use. Note that a modified load distribution beyond the intended adjustment range may lead to critical steering properties. The length of the saddle rails at the saddle frame as well as the saddle form are also an issue) > **Headlight** (With valid type approval, identical mounting position as well as EMC proof only) > **Rear light with brake light, and licence plate light, if available** (With valid type approval and identical mounting position only as far as tested in accordance with ECE-R 50 as well as EMC proof) > **Reflector** (With valid type approval only) > **Rear view mirror** (If tested in accordance with ECE-R 81 and identical mounting position only) > **Acoustic signalling device (horn)** (If tested in accordance with ECE-R 28 and identical mounting position only) > **Pedals** (Vehicles with 168/2013 approval) * **Note: In the case of components with part certificate the field of application must be observed. The proper assembly must be certified by a testing engineer or an expert of a technical control board like TUEV or DEKRA in Germany.**	> **Pedals** (Incl. approved reflectors, provided that the pedal is not wider than the series/original pedal (vehicle with 2002/24/EC approval)) > **Tyres** (As specified in the vehicle documents, either in accordance with ECE-R 75 or with approval of the tyre manufacturer. With a permissible overall weight less than 150 kg and a width less than 67 mm the tyres do not require approval according to UN ECE-R 75) > **Grips with screw clamps** (In this case, the vehicle width must not be modified) > **Headset** > **Bottom bracket** > **Rear and front derailleur** (All gear change parts must be suitable for the number of gears and compatible with one another) > **Shifters / Twist grip** (Provided that position on the handlebar remains unchanged) > **Cables and housings** > **Chainwheels / Belt sprockets / Cassette sprockets** (Provided that the number of teeth and the diameter is identical to the series/original field of use) > **Chainguard** (Provided that it is free of sharp outer edges and complies with the Delegated Regulation No. 44/2014, Annex VIII) > **Mudguard** (Provided that it is free of sharp outer edges and complies with the Delegated Regulation No. 44/2014, Annex VIII. The clearance to the tyre, which should be 10 mm at least, must also be taken into account) > **Spokes** (Provided that the dimensions correspond to the original part) > **Inner tube** (Provided that the design and the valve are identical) > **Crank arms** (Provided that both the length (centre of axle mount – centre of pedal thread) as well as the distance crank arms – frame centre (Q-factor) are observed) > **Chain / Toothed belt** (Provided that the original width is observed) > **Rim tape** (Rim tapes and rims must be compatible. Modified combinations may result in rim tape shifting and thus in defective inner tubes) > **Saddle** (Provided that the offset to the rear does not exceed 20 mm with regard to the series/original field of use. Note that a modified load distribution beyond the intended adjustment range may lead to critical steering properties. The length of the saddle rails at the saddle frame as well as the saddle form are also an issue)	> **Additional battery/rechargeable battery-operated headlights are not permissible.** > **Trailers are only permissible if a trailer load is entered under no. 2.1.7 of the certificate of conformity and a coupling device under no. 7.2.8. Note: The maximum permissible trailer load is 50 % of the tractor vehicle's empty weight (without batteries). There are only 50mm ball coupling devices possible.** > **Transporting children in a trailer is forbidden in general!** > **Front baskets are to be considered critical due to the undefined load distribution. Permissible after approval by the vehicle manufacturer only.** > **Removable pannier bags and top cases are permissible. The permissible total weight, maximum loading of the luggage carrier and a correct load distribution have to be observed.** > **Bar ends are not permissible.**

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This is the translation of the original guidelines issued by ZIV, VSF, BIV (German umbrella organisation for the German cycle industry guilds), velotech.de and the German Association for Technical Inspection (TÜV Rheinland) in cooperation with Zedler-Institut, updated in 2023. In the event of any misunderstandings, the original German version (Leitfaden für den Bauteiletausch bei S-Pedelecs mit Typ- oder Einzelgenehmigung mit einer Tretunterstützung bis 45 km/h) shall be applicable.

Experts of the following associations/companies were involved in drawing up the present guidelines (in alphabetic order):
Zweiradmechaniker-Handwerk (Bundesinnungsverband) | TÜVRheinland® Genau. Richtig. | velotech.de | VSF | zedler-Institut Technology and Passion for Bicycles | ZIV

Risks related to the tuning of e-bikes 25 (15.5) / EPACs/EAPCs

E-bikes 25 (15.5)/EPACs/EAPCs are limited to a continuous rated power of 250 watts and a maximum design speed through electrical pedal assistance of 25 kmh (15.5 mph).
In this case only they are equivalent to bicycles in terms of road traffic law (section 63a (2) of the German road traffic licensing regulations (inform yourself about the legislation in your country).

Raising the output and/or the maximum design speed beyond this limit will result in the fact that the bicycle becomes a motor vehicle.

The consequences are as follows*:

> Subject to compulsory type approval
> Subject to compulsory driving licence (class depends on maximum speed)
> Subject to compulsory insurance (insurance tag)
> Helmet compulsory
> Using cycle lanes not permissible
> Proof of fatigue strength for all safety-relevant components must be submitted

Possible legal consequences in case of tuning for users*:

> Administrative offence and penalty
> Criminal offence (section 21 of StVG (German Road Traffic Act): "Riding without driving licence": section 6 of PflVG (Law on compulsory insurance for motor vehicle holders); "Driving without insurance protection")
> **Caution: in the event of repetition, possibly entry in your criminal record certificate (previously convicted!)**
> Loss of insurance cover (private liability)
> Loss of materials defect liability and warranty claims
> Loss of driving licence
> Regularly, partial responsibility in case of accident

Possible legal consequences in case of tuning for retailers*:

> Aiding and abetting of an offence, participating in an administrative offence
> Retailer liable for personal and material damage
> Loss of business liability insurance cover

* for example in Germany, inform yourself about the legislation in your country

Translation and layout: Zedler-Institut
www.zedler.de
As of: 05/2023

This is the translation of the original guidelines issued by ZIV, VSF and BIV (German umbrella organisation for the German cycle industry guilds) in cooperation with velotech.de and Zedler-Institut, updated in 2023. In the event of any misunderstandings, the original German version (Risiken beim Tuning von E-Bikes 25/Pedelecs) shall be applicable.

Experts of the following associations/companies were involved in drawing up the present guidelines (in alphabetic order):

Zweiradmechaniker-Handwerk Bundesinnungsverband | velotech.de | VSF | zedler-Institut Technology and Passion for Bicycles | ZIV

LEGAL REQUIREMENTS FOR RIDING ON PUBLIC ROADS

In **Great Britain** (as of January 2024)

According to the **Highway Code** in Great Britain your bicycle must be equipped as follows:

1. **Lighting, rear lights, reflectors:**
   At night your bicycle must have:
   - a white front light (a)
   - a red rear light (b)
   - a red rear reflector
   - four amber pedal reflectors (if manufactured after October 1, 1985)

   In addition, it should be equipped with:
   - a white front reflector
   - spoke reflectors
   - flashing lights are permitted, a steady front lamp is however recommended.

   (Law RVLR regs 13, 18 & 24)

   It is not required that the prescribed lighting is mounted upon sale of the bicycle. If it is, however, it must comply with these regulations. Bicycles that are only used with good daylight visibility, such as e.g. road racing bicycles, are exempt from the lighting regulations.

2. **Brakes**
   Every bicycle must be equipped with at least one braking system.
   (Laws PCUR regs 6 & 10)

3. **Signalling devices**
   It is recommended that a bell be equipped.

4. **Cycle helmets**
   Wearing a cycle helmet which conforms to current regulations in the correct size and securely fastened is recommended.

5. **Child transport**
   There are no rules as to the transport of children with bicycles.

6. **Bike trailer lighting**
   Cycle trailers must be equipped with a red rear light as well as a triangular rear reflector with an ECE mark III or IIIA.

7. **Hand held mobile phones**
   Cycling with a hand held mobile phone is not illegal as such. You could, however, commit an offence of "careless riding" or "riding without due care and consideration". For safety reasons, you are strongly advised against using a mobile phone during cycling.

8. **Other issues**
   Using cycle lanes is not compulsory, but can make your journey safer. You must not cycle on a pavement.
   (Laws HA 1835 sect 72 & R(S)A 1984, sect 129)

SAFETY INSTRUCTIONS

- ***For more important information on cycling, see chapter "General Safety Instructions".***
- ***For further information see:***
  www.direct.gov.uk ***www.dft.gov.uk*** ***www.ctc.org.uk***

WARRANTY AND GUARANTEE

Your CROSS EPAC/EAPC was manufactured with care. Normally it is delivered to you by your CROSS dealer fully assembled.

As direct purchaser you have full warranty rights within the first two years after purchase. Contact your CROSS dealer in the event of defects.

To ensure a smooth handling of your complaint, it is necessary to present your receipt, your EPAC/EAPC card, the handover report and the service reports. Therefore, keep these documents in a safe place.

To ensure a long service life and good durability of your CROSS EPAC/EAPC, use it only for its intended purpose (see the chapter **"Before Your First Ride"** and **"Intended Use"**). The maximum permissible overall weight is specified on the type plate on the CROSS EPAC/EAPC or in the EPAC/EAPC card in these operating instructions. If you have any questions, contact your CROSS dealer. In addition, be sure to follow the manufacturers' mounting instructions (above all, the torque values of the bolts) as well as the prescribed maintenance schedule.

Observe the checks and routines listed in the translation of these original CROSS operating instructions, in the system instructions of the drive system manufacturer and in any other possibly enclosed manual (see the chapter **"Service and Maintenance Schedule"**) as well as the possibly necessary replacement of safety-relevant components, such as handlebar, brakes, etc.

SAFETY INSTRUCTIONS

This warranty law is only valid in the countries where the law has been ratified according to the renewed European regulations. Inform yourself about the regulations in your country. In the United Kingdom, see the respective regulations in the Consumer Rights Act 2015 (CRA 2015).

A Note on Wear

Some components of your CROSS EPAC/EAPC are subject to wear due to their function. The rate of wear will depend on the care, the maintenance and the way you use your CROSS EPAC/EAPC (mileage, riding in the rain, dirt, salt, additional load, etc.). CROSS EPACs/EAPCs that are often left standing in the open may also be subject to increased wear through weathering.

Regular care and maintenance increase the service life. Parts that have reached their limit of wear must be replaced.

This concerns:

- Rechargeable battery
- Drive chain
- Brake pads
- Brake fluid (DOT)
- Brake discs/rotors
- Brake cables
- Brake cable housings
- Seals of suspension elements
- Rims of rim brakes
- Rubber grips
- Cables/connectors
- Chainrings
- Illuminants
- Tyres and inner tubes
- Sprockets
- Saddle covering
- Shift cables
- Shift cable housings
- Pulleys
- Lubricants

SAFETY INSTRUCTIONS

Ask your CROSS dealer about any additional guarantee given by the manufacturer of your CROSS EPAC/EAPC and insist on having it as printed version.

SERVICE SCHEDULE – STAMP FIELDS

1st service

After 100–300 kilometres (60–180 miles) or 5 to 15 hours of initial use or 4–6 weeks, at the latest after three months from date of purchase

Order no.: _____

Date: _____

Mileage: _____

☐ All necessary maintenance work carried out (see service and maintenance schedule); replaced or repaired parts:

_____

_____

_____

_____

Stamp and signature of the CROSS dealer:

2nd service

After 2,000 kilometres (1,200 miles) or 100 hours of use at the latest or after one year

Order no.: _____

Date: _____

Mileage: _____

☐ All necessary maintenance work carried out (see service and maintenance schedule); replaced or repaired parts:

_____

_____

_____

_____

Stamp and signature of the CROSS dealer:

3rd service

After 4,000 kilometres (2,400 miles) or 200 hours of use at the latest or after two years

Order no.: _____

Date: _____

Mileage: _____

☐ All necessary maintenance work carried out (see service and maintenance schedule); replaced or repaired parts:

_____

_____

_____

_____

Stamp and signature of the CROSS dealer:

4th service

After 6,000 kilometres (3,600 miles) or 300 hours of use at the latest or after three years

Order no.: _____

Date: _____

Mileage: _____

☐ All necessary maintenance work carried out (see service and maintenance schedule); replaced or repaired parts:

_____

_____

_____

_____

_____

Stamp and signature of the CROSS dealer:

5th service

After 8,000 kilometres (4,800 miles) or 400 hours of use at the latest or after four years

Order no.: _____

Date: _____

Mileage: _____

☐ All necessary maintenance work carried out (see service and maintenance schedule); replaced or repaired parts:

_____

_____

_____

_____

_____

Stamp and signature of the CROSS dealer:

6th service

After 10,000 kilometres (6,000 miles) or 500 hours of use at the latest or after five years

Order no.: _____

Date: _____

Mileage: _____

☐ All necessary maintenance work carried out (see service and maintenance schedule); replaced or repaired parts:

_____

_____

_____

_____

_____

Stamp and signature of the CROSS dealer:

7th service

After 12,000 kilometres (7,200 miles) or 600 hours of use at the latest or after six years

Order no.: _____

Date: _____

Mileage: _____

☐ All necessary maintenance work carried out (see service and maintenance schedule); replaced or repaired parts:

_____

_____

_____

_____

_____

Stamp and signature of the CROSS dealer:

8th service

After 14,000 kilometres (8,400 miles) or 700 hours of use at the latest or after seven years

Order no.: _____

Date: _____

Mileage: _____

☐ All necessary maintenance work carried out (see service and maintenance schedule); replaced or repaired parts:

_____

_____

_____

_____

_____

Stamp and signature of the CROSS dealer:

9th service

After 16,000 kilometres (9,600 miles) or 800 hours of use at the latest or after eight years

Order no.: _____

Date: _____

Mileage: _____

☐ All necessary maintenance work carried out (see service and maintenance schedule); replaced or repaired parts:

_____

_____

_____

_____

_____

Stamp and signature of the CROSS dealer:

10th service

After 18,000 kilometres (10,800 miles) or 900 hours of use at the latest or after nine years

Order no.: _____

Date: _____

Mileage: _____

☐ All necessary maintenance work carried out (see service and maintenance schedule); replaced or repaired parts:

_____

_____

_____

_____

Stamp and signature of the CROSS dealer:

Notes

EPAC/EAPC CARD

Manufacturer CROSS LTD

Model _____

Frame no. _____

Drive system _____

☐ Front wheel motor ☐ Mid-mounted motor ☐ Rear wheel motor

Battery model _____

Key no. _____

Voltage (Volt) _____

Ampere-hour (AH) _____

Capacity (watt hours) _____

Suspension fork (manufacturer/model) – serial no. _____

Frame type _____

Frame size _____

Size of wheels and tyres _____

Colour _____

Special features _____

Intended Use

Use in accordance with ☐ Category 1 ☐ Category 2 "Everyday"

The CROSS EPAC/EAPC is not approved for use in competitions and bike parks.

Empty weight CROSS EPAC/EAPC (incl. battery) _____ kg

Maximum permissible overall weight _____ kg
CROSS EPAC/EAPC, rider, luggage and trailer, if available

Pannier rack permitted ☐ yes ☐ no

Permissible load _____ kg

Child seat permitted ☐ yes ☐ no

Trailer permitted ☐ yes ☐ no

Permissible trailer load _____ kg

Brake levers – Brake assignment

Right lever: ☐ front wheel brake ☐ rear wheel brake

Left lever: ☐ front wheel brake ☐ rear wheel brake

⚠ WARNING

Read at least the chapters "Before Your First Ride", "Intended Use" and "Before Every Ride" in the translation of these original CROSS operating instructions.

_____

Stamp and signature of the CROSS dealer

(Advice to the CROSS dealer: Copy the EPAC/EAPC card and the handover report and keep one copy in your customer file. Send another copy to the bike manufacturer, if necessary. Make sure the customer confirms by his signature on the handover report that his personal data are made available to the manufacturer.)

HANDOVER REPORT

The above-described CROSS EPAC/EAPC was delivered to the customer ready for use, i.e. after its final assembly, inspection and functional check as described below (additionally required routines in parentheses).

☐ Battery partially charged ☐ Lighting ☐ Brakes front and rear
☐ Suspension elements (adjusted to suit customer)
☐ Wheels (trueness/spoke tension/tyre pressure)
☐ Handlebar/stem (position/bolts with torque wrench)
☐ Pedals (adjustment of release force, if necessary)
☐ Saddle/seat post (saddle height and position of saddle adjusted to suit customer, bolts with torque wrench)
☐ Gears (limit stops!)
☐ Bolted connections of add-on parts (with torque wrench)
☐ Motor/drive unit/display
☐ Other routines performed _____

_____

☐ Test ride carried out

Name CROSS dealer _____

Street _____

ZIP code/city _____

Phone/Fax _____

E-mail _____

Delivery date, stamp, signature of CROSS dealer _____

The customer confirms with his signature that he received the CROSS EPAC/EAPC in proper condition along with the accompanying documents specified below and that he was instructed on the proper use of the CROSS EPAC/EAPC.

Additional instructions
☐ Brake system ☐ Drive unit ☐ Battery ☐ Gear system
☐ Seat post, stem ☐ Suspension fork ☐ Pedal system
☐ System instructions of the drive system manufacturer
☐ Others

Name customer _____

Street _____

ZIP code/city _____

Phone/Fax _____

E-mail _____

City, date _____

Signature of customer _____

☐ I hereby expressly consent that my above-mentioned data are stored by the CROSS dealer and made available to the manufacturer so that I can be contacted directly e.g. in the event of a recall. The data will not be transmitted to third parties or used otherwise.

Signature of customer _____

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