ORIGINAL INSTRUCTIONS

GEPIDA


Saddle
Seatpost
Seatpost clamp
Carrier
Rear light
V-brake
Rear reflector prism
Cassette
Disc brake
Quick-release
Rear derailleur
Chain
Wheels
Wheel rim
Tire with reflective strip
Handlebar
Stem
Headset
Frame
Front light
Fork
Disc brakes
Fender
Front derailleur
Hub dynamo
Quick-release
Pedals
Wheels
Wheel rim
Tire with reflective strip
Drive train

ENGLISH

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Dear Buyer,

Congratulations on your purchase of a new bicycle!
This user guide and warranty booklet will help you to learn about the technical aspects of today's bicycles and will ease the use and handling of your bicycle. In addition, you will find key information here about the care, maintenance, and safe use of your bicycle.
Given the large number of parts used in bicycle manufacturing, the present user guide covers only the most important subassemblies.
You will find more detailed information about individual parts in the attached presentations prepared by their manufacturers.
Before setting out on your first trip, we recommend that you take time to read the user guide and presentation prepared by the parts' manufacturers carefully.

If you see the above symbol in the user guide, please pay particular attention to that section as it contains important information.

If you see the above symbol in the user guide, the given section concerns a subject related to your personal safety. If you do not follow the instructions found there, you could be risking your safety, or even your life.

Legislative provisions and information

Provisions relating to bicycle lighting
According to the rules of the international highway code:
bicycles must be equipped with a dynamo, and one front and one rear light providing active lighting.

Obligatory bicycle accessories prescribed by the relevant decree of the Ministry of Transport, Communications, and Energy of Hungary:
1. White or amber front light.
2. Red rear light.
3. Red rear prism reflector
4. Two independent brakes.
5. Bell
6. Amber prism reflector across the spokes of at least the front wheel.

If any of these accessories are missing, the authorities may impose a fine!
Recommended bicycle accessories according to the decree of the Ministry of Transport, Communications, and Energy of Hungary:
a. Amber prism reflectors on the pedal and between the spokes
b. Width indicating prism reflector mounted on an arm
c. Rear-view mirror
d. Fender

You can find the exact text of the regulation below:
Technical criteria for operating a bicycle
Decree no. 6/1990 (IV. 12.) of the Ministry of Transport, Communications, and Energy
On the technical criteria of bringing into and maintaining in circulation road transport vehicles
Section 116 (1) The bicycle must be equipped with:
a) an easy-to-handle and reliable steering system (handlebar),
b) two brake systems that can be operated independently of each other, and one of which acts on the front, the other on the rear wheel,
c) an audible warning device, which may only be a bell,
d) a front lamp emitting white or cadmium yellow light,
e) a rear position lamp emitting red light visible from at least 150 meters in the dark in clear weather,
f) one or two red, symmetrically positioned light reflectors that are not triangular in shape,
g) one amber lateral reflector prism, reflective on both sides, placed on at least the front wheel (spoke reflector).
The light reflector prescribed in item g) must be fitted onto bicycles by December 31, 1991.

(2) The bicycle may be equipped with
- on its front a white light reflector,
- on its sides and on the front and rear of both pedals amber light reflectors, as well as a width indicator positioned on the left side of the bicycle, containing a white light reflector towards the front and a red one towards the rear.

(3) The light reflectors mounted on the bicycle must be visible in clear weather in the dark from 150 meters from a vehicle whose main beam is illuminating them.
(4) Bicycles with more than two wheels and wider than 0.80 m must be equipped on both sides with the lighting and light reflecting devices listed in items d)-f) of Article 1. These devices may not be more than 0.15 m from the widest point of the vehicle or closer than 0.60 m to each other.
(5) A child seat may only be mounted on a bicycle in such as a way that the seat and the child sitting on it do not obstruct the visibility and control of the rider, and do not cover the lighting and light reflecting devices of the bicycle. The seat must also be fitted with hand- and footrests. The seat and its hand- and footrests may not be connected with the steered wheel or the structure that turns with it.
(6) A two-track single-axle trailer max. 0.70 m wide and of max. 70 kg total weight may be attached to the bicycle (bicycle trailer).
(7) The bicycle trailer must be equipped with
a) on its rear a red, triangular light reflector (light reflector prescribed for trailers) positioned on or to the left of the median plane of the trailer, at a height of min. 0.35 m and max. 0.60 m from the road surface,
b) a rear position lamp identical to that prescribed for the bicycle. The electric switching of the rear position lamp of the bicycle trailer must ensure that switching it on causes the position lamp of the bicycle to switch off.
(8) The electric switching of the bicycle's lighting must ensure that all lights are switched on/off together.
(9) The lighting and light reflecting devices of the bicycle must be positioned as follows:
a) With regard to Article 1,
- the light mentioned in item d),
- the rear (red) position light mentioned in item e), and
- the rear (red) light reflector(s) mentioned in item f) and the front (white) light reflector mentioned in Article (2) must be positioned on the longitudinal vertical median plane of the bicycle in such a way that:
- none of them is closer than 0.35 m to the road surface,
- the lights are not farther than 0.90 m from the road surface,
- the light reflectors are not farther than 0.60 m from the road surface.

b) The (amber) lateral reflector prism (spoke reflector) mentioned in item g) of Article (1) mounted on the wheel must be positioned at a distance of 0.10-0.15 m from the tire.
c) The width indicator mentioned in Article (2) must be positioned 0.30-0.40 meters to the left of the longitudinal vertical median plane of the bicycle, at a height of 0.35-0.60 m from the road surface.

Personalised bicycle settings

In the following we will present the fine-tuning of the saddle and handlebar.

Figure 2

Figure 3

Figure 2:
The height of the saddle is set correctly if sitting on it with your leg extended you can touch the pedal in its lowest position with your heel. This must be set before adjusting the angle and horizontal position of the saddle.

Figure 3:
After you have completed all settings and tightened the necessary screws/bolts with the prescribed torque (see: Technical data), check once more that all settings are correct by sitting on the saddle and placing your heel onto the pedal in its lowest position: if your knee is slightly bent, the setting is correct.

⊖ For any adjustment you perform on your bicycle you will need experience, dexterity, and the correct tools. You will find the tightening torques to be used on bolt assemblies in the “Technical data” section of the user guide or in the descriptions provided by the manufacturers of parts. If you have any doubts, or wish to perform settings on the bicycle that affect safety, turn to your specialist dealer.

General safety advice

Your new bicycle is a technical instrument that requires regular maintenance to retain its proper condition and for you to enjoy it. You will find detailed information on the correct maintenance of your bicycle in the “Technical inspection procedure” section, directly after this chapter.

You will find the technical specifications of your bicycle, such as its maximum permitted load and/or loadability (the latter is indicated on the luggage rack) in the “Technical details” section.

⊖ Overloading the bicycle may lead to the breakage of its main parts or other malfunctions, which may endanger both the bicycle and your physical integrity.

Please, check your bicycle before each use! (You will find details of this in Article 1 of the “Technical inspection procedure”).
Parts that become damaged due to an accident or improper use must be replaced immediately. If you lack the necessary experience and technical instruments for the repair, visit a specialist service centre.

Before making any conversion to the bicycle, please consult your specialist dealer or the manufacturer, as otherwise the conversion might lead to the breakage of the frame or fork. In case of unprofessional conversion the warranty becomes void!
A child seat and/or trailer cannot be fitted to every bicycle model – for information, please consult your specialist dealer.

ⓘ The following items of advice concern your personal safety!
- Always cycle according to traffic conditions, ready to brake if necessary!
- Do not cycle with your hands off the handlebar!
- Ride particularly carefully on wet roads, as your braking distance could double!
- For your own safety, always wear light-coloured clothing (with a reflective strip on it, if possible) and a helmet!
- Switch on the bicycle's lights in bad weather and after twilight!
- Ride only as fast as your cycling skills allow!

- Only bikes that have been approved for use in public places, as per the applicable regulations (e.g. StVZO in Germany), may be used.
- Observe the maximum permitted gross weight of the various bike types, as this could otherwise lead to breakage or failure of safety-relevant components. The brake system is also only de- signed for the maximum permitted gross weight the bike. For a tist of the maximum permitted gross weights, refer to data.
- The gross weight is the sum of the weight of the bike + weight of the rider + weight of the luggage. The gross weight also includes towed weights such as trailers.
- If you notice that a part is damaged or warped, do not use bike until you have had the part replaced as otherwise parts that are important to operation of the bike may fail.
- Observe the maximum load-carrying capacity of the pannier rack. This is marked on the pannier rack directly.
- Have maintenance and repairs carried out by a professional bike workshop.
- If you make technical changes to your bike, take the national traffic regulations and applicable standards into account. Bear in mind that this could render your watranty invalid.
- Observe the maximum load-carrying capacity of the pannier rack. This is marked on the pannier rack directly.
- Have maintenance and repairs carried out by a professional bike workshop.
- If you make technical changes to your bike, take the national traffic regulations and applicable standards into account. Bear in mind that this could render your warranty invalid.
- Only replace electrical components on your bike with type-tested parts.
- Only ride with suitable lighting in unfavourable lighting conditions such as fog, rain, dawn/twi- light or in the dark.

Bear in mind that with intensive use of your bike wear increases accordingly. Many bike parts, particularly on light sports bikes, are only designed for a specific period of use. If this is exceeded, there is a consider- able risk that components could fail.
Perform care and maintenance on your bike regularly. In doing so, check important components, particularly the frame, fork, wheel suspension, handlebar, handle- bar stem, seatpost and brakes for warping and dam- age. If you notice changes such as cracks, bulges or warping, have your bike checked by a specialist cycle shop before using again.

Technical inspection procedure

The chapter on technical inspection is divided into two parts:

1. Parts that must be checked before each ride

- Braking and brake pads
- Brake lever (check its play)
- Stable attachment of the crank arm and pedals
- Correct setting of the telescopic fork
- Any tears or foreign bodies on the tires?
- Tire pressure
- Lighting equipment and dynamo
- Attachment of the fender and rack
- Secure position of the quick-release skewers/clamps (front and rear wheel, saddle)
- Minimum height setting of the seatpost and stem
- Functioning of acoustic devices (e.g. bell)

2. Parts that need to be checked periodically

- Each bolt assembly must be re-tightened with the correct torque
- Secure position and unobstructed motion of the bottom bracket
- Attachment of the chainring(s)
- Attachment of the pedals
- Gear shifting settings, front and rear derailleur gears for models with external shifters
- Wear of the chain and cassette
- Power Modulator for V-brakes
- Any wear or rusting of Bowden cables
- Play and free movement of the headset
- Setting of the rear shock
- Play of the spring-action seatpost
- Spokes are tight and in true

Maintenance overview

When?	What?	Where?
After 100-150 km	Chain maintenance with suitable lubricant (your specialist dealer can advise you)	At home or on the road
After 150 – 200 km, and depending on mileage at least once a year	Tightening all screws/bolts on the bicycle with the correct torque, re-adjusting derailleur gears/shifters and brakes, checking the lighting equipment, checking the tightness of spokes and truing them, shocks, crank arm, headset, handlebar, stem	In a specialist service centre
After 500 – 1000 km	Checking the wear of the chain and cassette. Checking the telescopic fork and the rear	In a specialist service centre
After approx. 1500 km	Dismantling, cleaning, and lubricating the hubs. Checking the wear of the hub gear, chain, and cassette. Checking the rear shock (and its air pressure, if applicable), dismantling and lubricating the telescopic fork, replacing faulty parts	In a specialist service centre
After approx. 3000 km	Major overhaul, dismantling, cleaning, lubricating all bearings and if necessary, replacing them, replacing the chain and cassette (with hub gear, as well). Re-tightening all screws/bolts.	In a specialist service centre
Before each ride	See Article 1	At home or on the road
After any off-road ride	Removing the dirt from the bicycle with lukewarm water, cleaning and lubricating the chain. Never use a high-pressure water jet to clean your bicycle, as it would wash out the lubricant from the bearings.	At home or on the road

General guidance on assembly and safety Steering

The steering assembly consists of the following: handlebar, stem, headset, grips, brake lever, shifters, and bell. Stems are available in the most diverse shapes, diameters, and materials. The type of handlebar we fit on our bicycles is essentially the one most suited to their intended use.

⊖ Never replace the handlebar without asking advice from your specialist dealer.

We can distinguish two different stem types: 1: Quill stems with adjustable height and 2: “A-Head” threadless stems, which form part of the headset, and are attached directly to the fork tube with two Allen screws. With “A-head” stems, the tightness of the headset can be set through the stem. The height of “A-Head” stems can only be adjusted minimally, and they are used mainly on MBT-, trekking-, and nowadays increasingly on racing bicycles. This stem type allows the rider to take up a sporty and aerodynamic sitting position, moving the centre of gravity onto the front axle. However, this sporty position places increased stress on the wrists and reduces comfort.

Traditional quill stems are of adjustable height: a “STOP” mark can be found on every quill stem, indicating the maximum height to which they can be pulled out.

The minimum insertion depth of the stem is 65 mm.

⊖ If you are replacing the stem with a longer one, make sure that the brake- and shift cables are of sufficient length and do not obstruct the free movement of the handlebar; otherwise there is a risk of accident during quick manoeuvres to avoid objects. If necessary, replace the Bowden cables (or get them replaced) with longer ones.

Adjusting the height of a quill stem

Figure 4

The height of a quill stem can be adjusted by loosening its bolt. Insert an appropriate tool (at least 6 mm Allen key) into the bolt socket and give it about three full anticlockwise turns. If the stem still does not move freely, loosen it by lightly tapping it with a rubber or plastic mallet. Set the loosened stem to the required height. Please take care not to pull out the stem beyond the maximum allowed height and that the brake and shift Bowden cables do not obstruct the free movement of the handlebar. Align the stem with the front wheel and secure it by tightening the bolt. Check that the stem is secured correctly by applying slight force to the handlebar to try and turn it with respect to the front wheel (do not use excessive force!).

Adjusting the height of an “A-Head” stem

Due to their design, the height of “A-Head” stems can only be adjusted slightly. One possibility is to replace the adjusting rings. In most cases this only enables a height adjustment of max. 5 mm, since to safely secure the stem a surface of sufficient size is necessary on the fork tube.
A more sensible solution is to replace the “A-head” stem.
“A-head” stems are available in different lengths and angles, so that everyone can find the sitting position most suitable for them. Stems for which the handlebars can be replaced using a clamp, without having to remove the grips and the shifter offer a particularly practical solution.
The angle of stems offered to cross-country cyclists is usually between 0 - 5°, their maximum length is 135 mm; however, in exceptional cases even longer stems can be available. This, however, reduces the steerability of the bicycle, and it will tend to run in a straight line. The shorter the stem, the easier it is to turn the bicycle; on the other hand, the bicycle will be more “restless” when ridden downhill fast.

Figure 5

Figure 6

Figure 7

A sportos Cross-country kerékpárosok részére elérhetők kormányszárak általában 0 és 5 fokos szög közöttiek, maximális hosszúságuk 135 mm.

Those who take frequent bike trips usually choose a shorter stem with a greater angle (over 10°) which allows a straight-backed riding position. Downhill riders prefer extremely short (approx. 80 mm) and steeply angled (approx. 30°) stems. With general use, the handlebar should be higher than the saddle, as this affords maximum control on steep downhill stretches, as well.

To replace the stem, undo the bolts on its top and remove the handlebar (Figure 5). Next, undo completely the bolt of the stem cap fixer. Remove the stem cap fixer (Figure 6), then undo the bolts on the side to remove the stem.

Take the new stem and temporarily secure the handlebar with the clamp. Next, place the stem onto the fork tube. Place the “A-Head” stem cap fixer over the socket of the stem, and insert the socket bolt. Tighten the bolt to set the tightness of the headset. If the headset has no play, and can be easily rotated, the stem must be secured with one or two bolts. Ensure that the stem is aligned with the front wheel when it is facing forward. Finally, adjust the handlebar so that your hand and lower arm are aligned, then tighten the bolts on the front of the stem.
Check that the stem is secured correctly by applying slight force to the handlebar to try and turn it with respect to the front wheel (do not use excessive force!).

Stems with adjustable angle

The angle of some stems – both traditional and “A-Head”– is adjustable. Loosen the angle adjustment bolt (using the bolt on the top/bottom of the stem or the stem bolt) and set the required angle, then tighten the angle adjustment bolt (Figure 8).

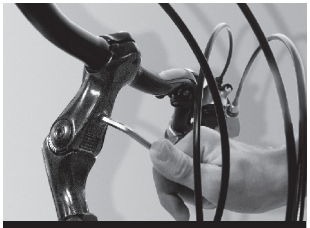

Figure 8

Figure 9

Figure 10

ⓘ Do not forget that if you change the angle of the stem, you might need to re-adjust the handlebar. The general rule still holds: your hand and lower arm should be aligned.

⊖ After a fall, crash, or jump, check that the stem and the handlebar are not damaged. Check that the stem and the handlebar are not bent, and have not been dangerously overloaded. If you notice any damage or have any doubts, replace the relevant parts.

You should also bear in mind that similarly to all safety elements of the bicycle, the handlebar also has “memory”: damages (falls, overload) leave their trace and their impact adds up over time. There comes a point when the part can no longer handle any more stress and breaks. Keep in mind any possible or previous damage, and for your own interest replace the necessary parts before they become damaged.

Saddle and seatpost

Saddle

The angle and longitudinal position of the saddle are determined by your personal preferences. It is important that you feel comfortable on your bicycle and can ride even long distances without feeling unpleasant pressure. In most cases, the initial setting made at the specialist dealership is not sufficient for this, and you may even need to consider buying a differently shaped saddle. Many different types of saddles are available nowadays, and it is not simple to select the most suitable one. As a result, the saddle is in most cases set to a level position, which takes the strain off the arms and wrists.

To adjust the horizontal position and/or angle of the saddle, loosen the bolt at the top of the seatpost. Push the saddle to the required position and re-tighten the mounting bolt of the seatpost. Check the stability of the saddle by forcefully attempting to change its angle.

ⓘ With traditional saddles, you will need a spanner (size 13 or 14) to adjust their position, while with modern saddle attachment systems, an Allen key (size 5 or 6). (Figure 10)


Figure 11

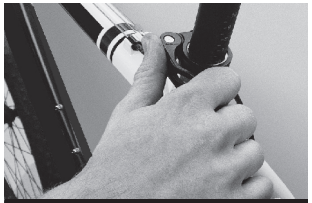
Figure 12

Saddle
Adjusting the height of the saddle

Undo the bolt that secures the seatpost or open the quick-release clamp, then set the saddle to the required height. Next, secure the seatpost by tightening the bolt or closing the quick-release clamp. Check that the saddle is secure by gripping its front and rear and attempting to turn it.

ⓘ Make sure that the seatpost can be moved easily within the frame and that it is greased (except with carbon seatposts!). Never use force to press the seatpost into the seat tube

⊖ It is extremely important that you respect the STOP, MAX, and MIN markings! These must always be observed and should never be exceeded.

“Stop” mark on the seatpost

⊖ Never pull out the seatpost beyond the STOP mark, otherwise the seatpost, seat tube, or frame might break, which could lead to a serious accident.

Figure 13

⊖ The minimum insertion depth of the seatpost is 2.5 times its diameter.
Example: For a seatpost with a diameter of 25.0 mm the minimum insertion depth is 62.5mm.

If the seatpost is too short, you need to purchase a new one. The diameter of the seatpost is indicated on its bottom; therefore you will not need callipers. Should you have any doubts about the adjustment of the seatpost, please turn to your specialist dealer.

ⓘ With frames on which the seat tube extends beyond the top tube, the seatpost must be inserted at least under the top tube or to the height of the rear seatstay. In this case the calculation method described above is not applicable!

Spring seatpost

On frames without a rear shock the spring seatpost takes the strain off the spine and spinal discs. Most designs have a spring displacement of 40 mm, and can be adjusted according to your weight with an Allen key (Figure 14).

ⓘ Please, read the attached information booklet of the manufacturer carefully!


Figure 14

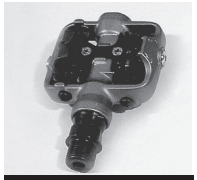
Figure 15/1


Figure 15/2


Figure 15/3

Pedals

Pedals come in a great variety of shapes, sizes, and qualities. In the basic case, the right-hand side pedal (marked with an “R”) has a right-hand thread, and the left-hand side pedal (marked with an “L”) has a left-hand thread.
For both pedals this means that they can be tightened towards the front wheel and loosened towards the rear– you will need a size 15, preferably long spanner.

If you are using clipless pedals (Figure 15/1), please practice getting on/off the pedals with the bicycle at rest. The release strength of most clipless pedals can be adjusted.
Please read the attached information booklet of the manufacturer carefully!

Drivetrain system


Figure 16

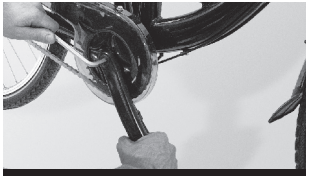
Figure 17

The bicycle's drivetrain system consists of the following components: bottom bracket, crank with pedals, chain, and cassette (cogset).

The bottom bracket is a part exposed to great stress, which fulfils its function almost unnoticed. Nowadays, the use of maintenance-free industrial bottom brackets on bicycles is on the increase. Manufacturers distinguish between two types of bottom bracket spindles: the traditional rectangular spindle, and bottom brackets connecting with several splines, which ensure a more durable and better transmission of force.
The most common bottom brackets follow the traditional BSA system (left-and right-threaded), or have an Italian thread, with a shell width of 68 or 73 mm. The width of the shell depends on the frame. In most cases, BSA threads are used, with a shell width of 68 mm. Besides these, spindle designs of different lengths also exist, depending on the crank used and the shape of the frame.

Please check the secure attachment of the bottom bracket regularly (Figure 16).

The crankset consists of right- and left parts. The chainrings are found on the right-hand side (1, 2 or 3 chainrings, depending on the design). Please check the tightness of the crank regularly. No play should be felt.

An incorrectly fitted crank could damage the rectangular spindle, and lead to its breakage. If the crank is not tight enough, immediately tighten its mounting bolt. If you do not have the appropriate tool (Figure 17), please turn to your specialist service centre.

The chain, cassette, and chainrings are wearing parts. Their service life depends on the extent of their use.

Derailleurs

The derailleur gears of the bicycle bring the rider's performance and desired speed in line with terrain conditions. Derailleur gears do not affect the amount of physical work to be performed, as work= force x distance. Derailleur gears basically influence the amount of force that needs to be exerted and the distance travelled. In practice, this means that if you shift to a low gear when riding uphill, you will need to exert only a small amount of force, but due to the high number of pedal turns you will travel more slowly.
If you shift to a high gear when cycling downhill, you will travel a greater distance with a single turn of the pedal, and accordingly will travel faster.
To be able to ride even longer distances without getting exhausted and to utilise your optimum performance, cycle with a cadence of 70 - 100 (number of crank revolutions per minute).

External derailleur gear systems

External derailleur gear systems consist of the following: front and rear derailleurs and shifters. The task of the front derailleur (Figure 18) is to move the chain between the front chainrings (2 or 3 chainrings). With the rear derailleur (Figure 19) the correct transmission ratio can be selected from usually 10 rear cogs. Derailleurs can be operated with the shifters mounted on the handlebar. In most cases, the left-hand side shifter controls the front, and the right-hand side the rear derailleur.

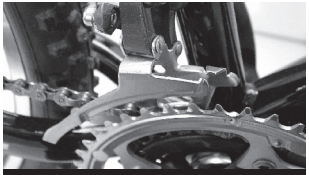

Figure 18

Figure 19

Since external derailleur gear systems are located on the outside of the bicycle and are not equipped with any protection, you should, if possible, wear tightly fitting trousers or use a clip to secure trouser legs so that they do not get pinched by the chain or cogs. This reduces the risk of falls.

Figure 20/1

Figure 20/2

Figure 20/3

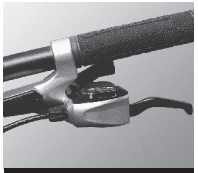

Figure 20/4

We can distinguish three types of shifters: grip shifts (Figure 20/1), shift levers (Figure 20/2) and combined brake and shift levers (Figures 20/3 and 20/4).
Shift levers have two functions: you can switch to a bigger cog with your thumb, or to a smaller one with your index finger. This means that by applying pressure to the left-hand side shifter with your thumb the front derailleur will move to a bigger chainring, resulting in a more demanding transmission ratio. The same movement on the right-hand side shifter produces an easier transmission. Grip shifts work on a similar principle. In general, if you rotate the grip shift towards yourself, you switch to a bigger cog, and in the opposite direction to a smaller one.
On combined brake- and shift levers the same lever functions as both brake and shift lever. Pull the lever to brake, and rotate it to shift between gears. Nowadays, use of this system has spread beyond racing bikes.

The most frequently used shift systems are manufactured by SHIMANO and CAMPAGNOLO.

In SHIMANO's “Dual Control” system (Figure 20/3) you must press the whole lever inwards to switch to a bigger cog. If you press the small lever, the shifter moves the chain onto a smaller cog.
Shifting on mountain bikes follows the same principle (Figure 20/4): depending on the design, by pressing the whole lever down you can switch to a bigger rear cog, and by lifting the lever with a finger to a smaller one. To help cyclists get used to shifting down a gear, these levers are equipped with a removable extra lever.
In the CAMPAGNOLO Ergo-Power integrated gearshift and brake lever system you can shift to a bigger cog by pressing the lever underneath the brake lever. Use the thumb shifter next to it to shift to a smaller cog. The current product offer of CAMPAGNOLO does not contain any integrated gearshift and brake lever systems for mountain bikes.

- Never shift gears using both levers of the same shifter at the same time!
- Never shift gears if the bicycle is at rest!
- Do not pedal backwards while shifting gears!
- Do not use force to shift gears!

To assist the smooth transition of the chain between cogs, it is important that you ride at a steady speed while shifting gears. If possible, refrain from shifting gears under a heavy load, as this greatly increases the wear of the chain and chainrings.

Try to avoid gears that make the chain cross over at an extreme angle, as they greatly increase its wear and internal resistance, and lead to the premature wearing away of cogs (Figure 21).

Figure 21

Derailleur gear systems: control and readjustment

The shifters of your new bicycle were set correctly at the specialist dealership. Nonetheless, the Bowden shift cables may stretch, causing the incorrect functioning of the shifter. Since all shift systems operate on the principle of tensile stress, the shift cables must be tightened properly to ensure correct shifting.

1. One way to do this is by turning the adjustment screw located on the shifter or shift lever to the left. Always turn the adjustment screw only a little, and keep checking whether the shifter works correctly. As a rule of thumb, two quarter-turn adjustments are better than a single half-turn one. If the chain no longer passes freely from the biggest cog to the smallest one, the shift cable is too tight, and should be loosened by turning the adjustment screw to the right in small steps.

2. If the tension of the shift cable can no longer be set correctly with the adjustment screw, undo the screw that secures the shift cable and pull the cable tighter. Make sure that the adjustment screw is not fully tightened – this way you can loosen the shift cable if you have overtightened it. Try shifting gears: if it does not work correctly, repeat the steps described in Article 1.

Checking and adjusting the stopping points on shifters

You will find two screws on the shifter with which you can adjust the stopping points of shifting. These screws are usually marked with an “H” for “high gear” (smallest cog) and “L” for ”low gear” (biggest cog). By turning the screw inwards, you shorten (restrict) the shifting path for the given side. By turning it outwards, you lengthen (loosen) the shifting path. The two screws (“H” and “L”) must be set in such a way that the cage should alternately align with the biggest and smallest cog. In these two positions the cage must not move farther in than the biggest cog or farther out than the smallest one. With the screw marked “H” on the shifter, the hardest gear (smallest cog) can be set, and with the screw marked “L”, the easiest one (biggest cog).
If the shifter is not correctly adjusted, the chain can get stuck between the spokes (in this case, the adjustment screw marked “L” must be tightened), or between the bottom cog and the frame (in this case, the adjustment screw marked “H” must be tightened).

Please note that the stopping points of shifting must be set with the Bowden shift cables loose.

Front derailleur

The front derailleur must be secured in such a way that the chain guide is positioned over the biggest chainring, without touching it in its highest position. The minimum distance between the front derailleur and the biggest chainring is 3 mm. The chain guide must be parallel to the chain.

Fine-tuning

With the two screws (“High” and “Low”) the stopping points of shifting can be set. The screw marked “Low” regulates the internal shifting point. To do this, shift to the biggest cog on the rear and the smallest chainring on the front. The chain should not touch the inside of the frame. However, the distance between them should be kept minimal. If you would like to adjust the screw marked “Low”, you can re-adjust the tension of the shift cable. Shift to the smallest cog on the rear and the biggest chainring on the front. The chain should not touch the front derailleur in this case, either. Using the screw marked “High”, set the external shifting point to the tightest possible position.

Please note that the shift cables should be loosened when setting the stopping points of the front derailleur, as well.
The length of the shifting path necessary to shift to a given gear can only be set on the shift lever.

Correctly setting the shifter requires dexterity and experience. If you would rather not perform this setting by yourself, turn to a specialist service centre. An incorrectly adjusted shift system can cause serious mechanical damage to your bicycle. To ensure the correct setting, please read the user guide provided by the manufacturer of the shift system.

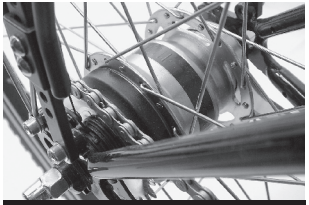

Figure 22/1

Figure 22/2

Hub gear

The epicyclic gearing inside the rear hub controls the gear ratio between the ring gear and the hub. The inner sun gear uses an arm to shift between gears (3-speed hub gear).
This gear design is becoming increasingly popular due to its minimal maintenance need.
Thanks to its integrated design, the greatest part of the gear system is located inside the hub, which makes it almost fully resistant to dust and other forms of contamination. A great variety of hub gears can be found on the market today, from which the most widely used are the products of SRAM and SHIMANO. With 3-, 4-, 5-, 7- or 8 speeds, an automatic shifting system and different brake systems (e.g. rim brakes), these shift systems can satisfy every individual need.
A further advantage of hub gears is that the chain is not actively involved in the shifting process, but always moves along a straight line, which greatly reduces its wear in comparison with external shift systems.
Nowadays, almost all hub gears are controlled by a grip shift which indicates the speed setting.

There are great differences between the methods used to set the different systems. Usually two markings need to be aligned on the hub or the Bowden cable. With hub gears, too, the required speed is set through the correct tension of the shift cable. To set the shifting path, most grip shifts are equipped with an adjustment screw, with the exception of the 14-speed “Rohloff” hub gear design, the so-called “Speedhub 14/500”. Due to the relatively small differences between speed settings, this hub gear is designed primarily for the needs of mountain bike riders who prefer a sporty riding style, but it is also suitable for those using of touring and trekking bikes.

ⓘ Correctly setting the shifter requires dexterity and experience. If you would rather not perform this setting by yourself, turn to a specialist service centre. An incorrectly adjusted shift system can cause serious mechanical damage to your bicycle. To ensure the correct setting, please read the user guide provided by the manufacturer of the shift system.

Chain

The chain plays a key role in the effortless and quick progress of the bicycle, as it transmits the force exerted by the rider. In the ideal case, one or two percent of the exerted force is lost between the crank and the rear wheel. No matter how robust a chain might appear, it suffers from a “chronic illness”: link wear. In the case sport cyclists, the chain must transmit a huge amount of torque to the cogs. In addition, it is relentlessly exposed to contamination, and possibly to rain or water splashes, which cause stress to the links and wear them away. This can only be prevented with a fully enclosed chain protection system, as this is the only sure way to keep the chain free from contamination. Since such a system is only used on “Holland” type bicycles, the chain requires regular maintenance.

For this, use wax, mineral oil, grease, or Teflon/silicone spray available at specialist dealerships. To reduce the wear of the chain and extend its service life, make sure to perform maintenance on it after rain and every off-road ride. With external gear shift systems, avoid chainring-cog combinations that cause the chain to cross over at an extreme angle – if possible, shift up or down one chainring.

ⓘ Make sure to remove any excess lubricant from the chain during its maintenance. Sand and dirt can stick to excess lubricant on the chain, greatly increasing its wear. Please respect the prescribed maintenance intervals.

Since close to 100% of lubricants used on a bicycle's chain end up in the groundwater, in particular those who ride in forests and on terrain should ensure that they use a non-toxic, biologically degradable lubricant. Please do not use gear oil, which is mistakenly hailed as a “miracle product”.

The chain belongs to the wearing parts of the bicycle, but as we have already mentioned above, you can greatly extend its service life. The service life of the chain also depends on the shift system. With external shift systems, the chain may need to be replaced already after 2000-3000 km. With hub gears, this value can be twice as high, depending on the degree of care and your cycling style.

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With external shift systems, you can check the wear of the chain by pinching it together with your left hand at the chain stay and attempting to take it off the chainring with your right hand. If little force is needed to remove the chain, it is probably very stretched and needs to be replaced.

Figure 23

With hub gears, the yield of the chain should not exceed 1-2 cm. If this is not the case, the chain needs to be tightened by loosening both nuts on the rear axle (on models with coaster brakes the clutch, as well) and pulling the released wheel back until the chain becomes sufficiently tight. Set the rear wheel in the correct position and tighten its mounting bolts and the clutch (if there is one).

ⓘ The state of wear of your chain can be measured precisely at your specialist service centre using special instruments. Replacing the chain requires special tools and experience. Ask your specialist service centre for help in selecting the correct chain, and have them fit it on your bicycle.

⊖ Attention: a badly assembled chain can lead to serious falls and considerable damage of your bicycle.

Brakes

Always ride with a safe distance between you and other vehicles or objects to give yourself adequate room to stop. Adjust distances and brake forces to suit riding conditions and speeds. For safest braking, use your brakes smoothly and evenly. Look ahead and adjust your speed in advance to avoid hard braking. Different bikes have different brake systems and different levels of brake power depending on their use condition. Be aware of your bicycle's braking power and don't ride beyond it. If you want more — or less — braking power, consult your bike shop. Wet, debris- strewn, or uneven pavement will affect how your bike reacts to braking. Take extra care when braking under less-than-ideal road conditions. Keep it smooth, and allow more time and distance for stopping.
Brake force applied to the front wheel suddenly or too fully could lift the rear wheel off the ground or cause the front wheel to slide out from under you. This will decrease your control and cause you to fall.

Hand brakes

Before riding, make sure you know which brake lever controls which brake (front or rear). If you have two hand brakes, apply both brakes at the same time. The front brake provides more stopping power than the rear, so do not use it too forcefully or too abruptly. Gradually add pressure to both brakes until you slow to the desired speed or stop.
If you must stop quickly, shift your weight back as you apply the brakes to keep the rear wheel on the ground.

⊖ Attention: Brake force applied to the front wheel suddenly or too fully could lift the rear wheel off the ground or cause the front wheel to slide out from under you. This will decrease your control and cause you to fall.

Cantilever brake and V- brake

Today's modern bicycles are equipped with a so-called V-brake, which exerts the braking force on the wheel rim. This brake system makes the braking triangle of former cantilever brakes obsolete, and the brake cable can be routed to the brake pads without having to secure it to the frame or fork. Centering of the brake is assisted by dust-protected stretch springs and fine-tuning screws.

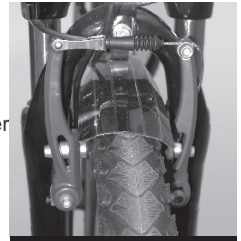


Figure 24

Most V-brakes are equipped with rubber brake pads situated – as with cantilevered brakes – in front of the brake body. Imprecision in the setting of brake pads can be simply corrected with the semicircular washer.

⊖ Attention: V-brakes have great braking power! Brake carefully at first, so that you can get to know your brake system. For a controlled brake path, regulate the braking power simultaneously with the two brake levers.
The correct setting of the brake requires dexterity and experience. If you would rather not perform this setting by yourself, turn to a specialist service centre. To ensure the correct setting, please read the user guide provided by the manufacturer of the brake system.

Hydraulic brakes

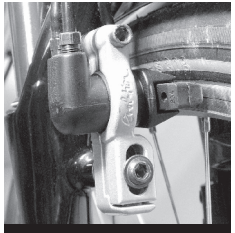


Figure 25

In hydraulic brakes, braking power is transmitted not by Bowden cables, but through the medium of oil. Their operational principle is the following: through a mechanical system the brake lever exerts pressure on the master cylinder, which in turn squeezes the oil through the brake line onto the brake cylinder with a specific leverage. Due to the difference between the diameters of the piston rod and of the brake piston, the braking pressure will be higher at the latter, which presses the attached brake pads to the rim. Hydraulic brake systems have several advantages. Brake cables are not exposed to rusting, and even if they are routed along the frame with several sharp bends, there is no loss of braking power. Braking power is between good and very good, with good manageability and controllable application. Hydraulic brakes require only minimal maintenance, and should maintenance become necessary (e.g. because of a fall or the special position of the brake pipe), special service sets exist to assist with it.

ⓘ The correct setting of the brake requires dexterity and experience. If you would rather not perform this setting by yourself, turn to a specialist service centre. An incorrectly adjusted brake can cause serious mechanical damage to your bicycle. To ensure the correct setting, please read the user guide provided by the manufacturer of the brake system.

Disc brakes

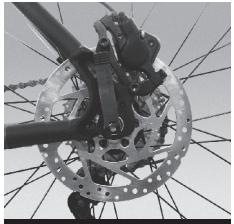


Figure 26

Most disc brakes consist of the following parts: a steel brake disc secured to the wheel hub, and callipers attached to the fork and the frame. Since the brake disc rotates with a precision of a tenth of a millimetre, the distance between the brake disc and the brake pads can be minimised. Compared to brakes that act on the wheel rim, the disc brake represents an extremely efficient brake system due to its greater displacement. The high pressure required to move the pads of disc brakes is produced hydraulically.

The correct setting of the brake requires dexterity and experience. If you would rather not perform this setting by yourself, turn to a specialist service centre. An incorrectly adjusted brake can cause serious mechanical damage to your bicycle. To ensure the correct setting, please read the user guide provided by the manufacturer of the brake system.

The brake pads of disc brakes need to wear down sufficiently to exert their full braking force. Disc brakes can only be fitted on bicycles that have been correctly prepared for this.
When installing, removing and carrying out mainte- nance on the wheel, do not touch the brake disc with your fingers when it is turning. You could be seriously injured if you catch your fingers in the cutouts of the brake disc. The brake calliper and the disc can become extremely hot when braking. You should therefore not touch these parts when riding the bike or immediately after dismounting as you could burn yourself. Before ad- justing the brakes, check that the parts have cooled down sufficiently.

Rim brakes

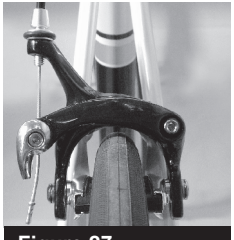


Figure 27

Rim brakes are nowadays used almost only on racing bikes. With these brakes, the brake bodies are suspended vertically and so form a closed system. Rim brakes are simply inserted into pre-bored holes to attach them to the frame or the fork. Make sure that the wheel is at the centre of the brake, and that both brake pads touch the rim at the same time when the brake lever is squeezed.

If this is not the case, the brake needs to be adjusted. On brakes with a single point of rotation, turn the mounting screw to the correct position using a spanner. On brakes with two points of rotation, centre the brake with the grub screw.

Always adjust the brake in small steps, and check its correct centring by squeezing the brake lever. To assist a quick wheel change, rim brakes are equipped with a quick-release clamp. Before each ride, check that this clamp is in closed position, as the brake will not function correctly if it is open.

To ensure that the brake is set correctly, please read the user guide provided by the manufacturer of the brake system.

Coaster brakes

With coaster brakes the braking force is transmitted by the foot via the chain to the brake system. If applied continuously for an extended period, coaster brakes become very hot. This reduces the braking performance and can result in complete failure of the brake. You should adapt your handling accordingly.

The coaster brake is operated by pedalling back- wards.
The force applied by the coaster brake varies depending on the position of your feet/pedals.If the crank arms are vertical, i.e. one of your feet is in the highest position and the other is in the lowest position, you cannot brake hard. Move the crank arms into a horizontal position if you think you may want/ have to brake.

The coaster brake is easy to apply in a controlled manner. The maximum braking performance is only reached after a certain run-in period. Operate the coaster brake carefully to familiarise yourself with it and get a feel for its retarding effect. If you have not used your bike for a while, there may be surface rust in the brake drum which can increase the braking force. If you have not used your bike for some time, you should brake gently several times when riding off to remove the surface rust. This pre- vents sudden blocking of the brake. If excessive overheating of the hub occurs, this can lead to loss of lubricant and a sharper braking effect. In these cases, have the brake checked by a profes- sional bike workshop.

Maintenance and replacement of brake pads


Figure 28

Check the brake system before each ride. Make sure that the brake lever begins to exert the braking force in a position that is comfortable for you.
Check also the correct position and wear of the brake pads. To assist the checking of wear, the brake pads of cantilevered, hydraulic, and rim brakes are marked with grooves. If these grooves are no longer visible, the brake pads need to be replaced.

On mechanically operated brake systems make sure that the brake cable can move freely. Rusty or damaged brake cables must be replaced immediately to prevent the malfunctioning of the brake and resulting accidents.
After any operation performed on the brake system – e.g. adjustment, replacement of brake cables or brake pads – check the functioning of the brake with the bicycle at rest. Badly adjusted brake pads can lead to faulty operation of the brake, and there is a risk that the brake might become blocked, which could cause an accident.

The correct setting of the brake requires a great deal of dexterity and experience, as the brake contributes greatly to the safety of the ride. If you would rather not perform this setting by yourself, turn to a specialist service centre. An incorrectly adjusted brake can cause serious mechanical damage to your bicycle. To ensure the correct setting, please read the user guide provided by the manufacturer of the brake system.

Headset

Traditional headset


Figure 29

The headset connects the fork, the stem, and the handlebar to the frame so that it can turn.
To keep your bicycle travelling in a straight line, you need to make small corrective movements with the handlebar. This requires highly free movement from the headset, otherwise the effect of the corrective movements would be exerted too late or with too great a force, resulting in the under- or oversteering of the bicycle. This is why ball- or needle bearings are used, as unlike the bearings of the pedal or the hub, they do not make full revolutions but only move to and fro within a small area. The forces transmitted from the road by the wheel and the fork must be borne by the headset within this tiny area. Due to the constant stress resulting from this, the headset might become loose and badly adjusted.
If the headset is too loose, the shocks transmitted from the road will exert too large a strain on the rear ball bearings. This stress leaves its traces on the bearing shell regardless of the distance travelled.

Consequence: the handlebar will tend to get stuck, and steering will not be free from resistance. In this case the headset needs to be replaced.
Pay attention to the play of the headset, and readjust it if necessary. With the correct setting, the resulting forces will be distributed evenly across the bearings, and the handlebar will no longer get stuck.

Checking the play and free rotation of the headset

1. To check the play of the headset, squeeze the front brake lever, and place one finger of your other hand around the headset. Next, try to move your bicycle backwards and forwards while keeping the brake lever squeezed. If you notice any ”knock”, it means that the headset has play, and must be readjusted to eliminate it.
2. To check the free rotation of the headset lift up slightly the front of your bicycle and turn the handlebar from the right to the left until its stopping points. The handlebar should not get stuck in any position.

Adjusting a traditional headset

To adjust a traditional headset, you will need two flat spanners (32, 36 or 40 mm, depending on the diameter of the headset). Stand in front of your bicycle, and hold the handlebar tight with your legs. Place both spanners onto the screw of the headset, and undo the top counternut. Next, tighten the bottom screw until the play of the headset ceases. Leave the bottom screw in the position you have set, and screw the counternut on it. When the counternut touches the screw of the headset, the latter (bottom screw) must be pulled in the direction of the counternut (upwards) to prevent the subsequent loosening of the headset.

ⓘ Pulling the screw in the opposite direction can increase the play of the headset!
Please check again the play and free rotation of the headset. If the headset is too tight or too loose, repeat the adjustment

ⓘ To avoid damaging the headset, do not tighten the bottom headset screw with too much force!

⊖ The correct setting of the headset requires dexterity and experience. If you would rather not perform this setting by yourself, turn to a specialist service centre. An incorrectly adjusted headset can cause serious mechanical damage to your bicycle.

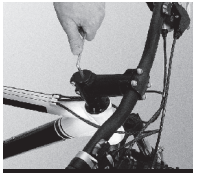


Figure 6


Figure 7

“A-head” headset

With an “A-Head” headset the stem plays an important role in its correct setting. In this system, the stem is secured not with a socket screw, but on the threadless external part of the fork tube. If you notice any play (you will find its description in the chapter entitled: “Checking the play and free rotation of the headset”) undo the screws on the side of the stem (Figure 7) and using the correct Allen key, tighten the headset adjusting socket screw on the top of the stem.

ⓘ To avoid damaging the headset, do not tighten its adjustment screw too much!
Next, adjust the headset so that it is positioned vertically over the front wheel. Tighten the bolts on the stem and check the play and free movement of the handlebar.

⊖ The correct setting of the headset requires dexterity and experience. An incorrect setting could damage the headset or lead to the breakage of the fork, putting yourself and your bicycle in grave danger. If you would rather not perform this setting by yourself, turn to a specialist service centre.

Wheels

Nothing is more important for the effortless progress of your bicycle as its wheels. What exactly determines the optimal rolling of the wheels? The following list summarises the main components of the wheel:

- Bicycle tire without an inner tube
- Tubular tire (for racing bikes with a special rim)
- Traditional bicycle tires with an inner tube
- Rim
- Wheel hub
- Spokes and spoke nut

At the centre of the wheel lies the hub, which rotates around a spindle with the help of bearings. The hub is secured to the centre of the rim with spokes. The tire consists of the following parts: tread, inner tube, and rim strip. A new development is the appearance of rubber tires without an inner tube, which have long been used on cars and motorcycles.

The rim, spokes, hub, and tire are selected mainly based on safety and reliability aspects. The wheels of your bicycle are exposed to a major load.

Even if the wheel has been carefully assembled and trued, its spokes will become loose with initial use. It is important therefore to have the wheel re-trued at a specialist service centre after approx. 100-200 km, as this greatly extends the service life of the wheel. The uniform tightness of the spokes and the regular rolling of the wheel (it is not out of true) must be checked during subsequent maintenance sessions, as well.

Spokes

Spokes connect the rim to the hub. The wheel will reach its required stability only if the spokes are tightened correctly.
Each spoke tries to pull the rim towards the hub. Since all spokes try to do this at the same time and with the same force, in the end none of the spokes will move the hub. When external forces arise, the hub, rim, and spokes act in harmony. The arising force is distributed, and every element needs to bear only a small part of it. The weight of the cyclist slightly compresses the rim in the contact area with the road, which takes the load off the spokes above it. The non-uniform distribution of force is automatically balanced by the wheel, which places a larger load on the other spokes.
Spokes might break if the wheel is subjected to great stress. As a result, the tightness of spokes will not be uniform around the wheel, and the rim will “knock” sideways or upwards.
Only by replacing the spoke(s) in question and re-trueing the wheel can the desired performance of the wheel be secured.

⊖ Replacing a spoke and re-trueing a wheel requires dexterity and experience. If you would rather not perform this setting by yourself, turn to a specialist service centre!

ⓘ The incorrect alignment of the wheel (e.g. it “knocks” or is out of true) puts you in danger. With brake systems in which the brake pads touch the side of the rim, the brake may get stuck between the rims, which immediately blocks the wheel, causing a serious accident risk!

Rims

Rims are an important part of your bicycle. This is not only because on most modern bikes the brakes act on the rim. Rims are available in a great variety of shapes, materials, and sizes. Many manufacturers place a wear indicator strip on the side of the rim to allow visual checking of its condition.

In the long run, all rims are wearing parts. The pressure load, the wearing effect of the brake pads, and the load arising from cycling all wear out the aluminium profile of the rim.
It is difficult to say exactly when a rim is no longer usable – this greatly depends on your cycling and braking style.
You can contribute significantly to extending the service life of the rim by always maintaining the correct tire pressure.

⊖ If the wear indicator strip on the side of the rim drops below a critical level, the increased tire pressure will damage the rim, with the possible consequence of a puncture or a blocked wheel. Warning: accident risk! Have the wear of your rim checked regularly by your specialist service centre.

Hubs

Bicycle hubs are still being fitted with cup and cone bearings due to their ability to handle great loads. The bearings roll along a greased track between the cone and the cup. The play of bearings can be regulated with the cone located on the threaded axle. The hub is insulated against the various forms of contamination.
In recent years, the use of so-called industrial bearings has become increasingly widespread. They have a long service life and roll exceedingly smoothly.

Old axle types were secured with a screw. Today's hubs use a quick-release system composed of a cam and a quick-release skewer (see the chapter describing the quick-release skewer).

Wheels are secured to the fork or frame through the hub. For traditional, solid axles, this is done with 15 mm hex nuts. Use a 15 mm spanner to insert and remove the wheel. In quick-release systems, you will not need any tools, as you can simply secure the axle by manually turning the quick-release skewer.

ⓘ The play of cup and cone bearings must be checked regularly! Try to move the wheel sideways manually within the fork or seat stay. You should not be able to feel any play. You can also check the free rotation of the wheel by slightly lifting the bicycle and turning its wheel. The wheel should make a couple of revolutions, then come to a stop. If the axle has play or is stuck, it must be readjusted. The correct setting requires dexterity and experience. If you would rather not perform this setting by yourself, turn to a specialist service centre!

Rubber tire, inner tube, and air pressure

The ideal tire must efficiently reduce the impact of an uneven road surface, be protected against punctures, and possess low rolling resistance. The tire provides the traction and road holding necessary for braking, taking bends, and accelerating. If you reduce the tire pressure, you lose the benefit of low rolling resistance; on the other hand, the following improve:

- ride comfort
- traction on wet or uneven roads or terrain

However, if the tire pressure is too low, the inner tube may burst when passing over kerbs. The tire will only operate correctly and resist a possible puncture if its pressure is correct. This also takes the strain off both the rider and the bicycle. Tires are available in a great variety of designs, sizes, and qualities. When replacing a tire, pay attention to its size. The size of the tire is usually indicated on it with two values: in millimetres, according to the metric system, and in inches.
Accordingly, the size of a tire can be for example 26 x 1.75, if given in inches, and 47-559 mm, if using the metric system. 47 mm indicates the width of the tire, 559 mm its diameter.
Most tire manufacturers indicate the optimal and maximum tire pressure values. On one side of the tire, the optimal pressure range is indicated by giving its minimum and maximum limits. Since pressure is often indicated in PSI, you will find a conversion chart from PSI to bar in the chapter on Technical Data. Most modern tires also contain an inner tube. The use of tires without an inner tube is also becoming increasingly widespread, at least among mountain bikes. This tire type, which has long been used on cars and motorbikes, greatly reduces the risk of punctures.

Valve types

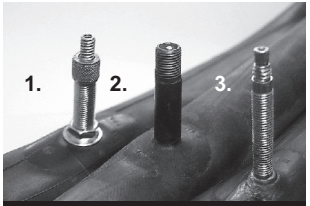


Figure 30

We can distinguish between three valve types.

1. Woods or English valve
These are still the most commonly used valve type. They are mainly used on entry-level models and on children's bicycles. With the English valve, the air has to be pumped through a simple shut-off valve with the correct pressure. This valve type is not recommended for use with high tire pressure.

2. Car valve
These are most commonly used on mountain bikes. Air can be pumped into the tire after opening a threaded valve core. The valve core is released by a wedge located in the pump head when the pump is placed onto the valve. To ensure that the valve core is opened correctly, the pump must be pressed sufficiently onto the valve stem. It is also important to position the rubber sealing ring inside the pump head in such a way that it prevents the escape of air from between the valve and the pump head.

3. Presta valve
Presta valves were once used only on racing bikes. Nowadays, however, they have become common on light mountain bikes, as well. To be able to inflate the inner tube, the small brass cap on the valve stem must be unscrewed and raised to its top. Test: when you press down on the top of the valve, air should escape from the inner tube. The head of the pump must be placed precisely onto the valve, without touching the valve stem if possible.

Frame and fork

Frame

The frame constitutes the central element of the bicycle. The sitting position, ride characteristics, and travel comfort all depend on the frame. Frames are manufactured from different materials, such as steel, aluminium, or carbon. The widespread use of the traditional diamond frame composed of two triangles is due to its economic use of materials, the beneficial support provided by its angles, and its stability. This frame combines a high load-bearing capacity with favourable ride characteristics.

Bicycle frames are designed to withstand different types of stress. The frame must in the first place bear its own weight and that of the various parts mounted on it. These loads are known as static loads. In addition, the frame must also bear the weight of the rider, the forces resulting from riding and braking, and the stresses caused by the roughness of the road surface. These are dynamic loads, which exert a greater strain on the frame due to their intensity and varied extent.

⊖ After any accident or fall always visit a professional service centre and get your bicycle checked. This also includes assessing the condition of the frame. Have the damaged parts replaced. You could risk your life by riding a bicycle with damaged parts. Parts could break, causing an accident!

Forks made of carbon require extra care. Carbon is particularly rigid and unlike aluminium or steel does not change its shape before it breaks. This means that carbon fibres could become seriously damaged in a fall without leaving any visible trace, and this damage could lead to the breakage of the fork, causing an accident risk!

Fork

Most rigid forks are made of steel, aluminium, or carbon fibres. The lower part of the fork is slightly curved, which allows it to partly absorb the shocks resulting from the roughness of the road surface, transmitting only part of their impact towards the handlebar.

⊖ After any accident or fall always visit a professional service centre and get your bicycle checked. This also includes assessing the condition of the fork. Have the damaged parts replaced. You could be risking your life by riding a bicycle with damaged parts. By riding a bicycle with a twisted or cracked fork you are risking an accident and even your life!

Forks made of carbon require extra care. Carbon is particularly rigid and unlike aluminium or steel does not change its shape before it breaks. This means that carbon fibres could become seriously damaged in a fall without leaving any visible trace, and this damage could lead to the breakage of the fork, causing a risk of accident!

Telescopic forks

In recent years the use of telescopic forks has become widespread in nearly every segment of bicycles. Telescopic forks improve ride comfort and control of the bicycle on terrain or bad roads. On rear spring shocks, which greatly reduce the stress acting on the bicycle and its rider – mainly on the wrists, arms, and shoulders – telescopic systems are the most widespread, due to their simple structure.
Telescopic forks can be differentiated according to the type of suspension, the structure of the telescope, and the spring's displacement. Suspension can be provided by steel springs, special plastics (elastomer system) or air. Damping is usually performed by oil inside closed chambers.

Setting the telescopic forks

The spring displacement of a telescopic fork can be determined with a very simple method: attach a cable tie with medium strength to the bottom of the sliding fork tube. The roughness of the terrain will push up the cable tie along with the movement of the telescope, clearly indicating how much of the available spring displacement is utilised. As a rule of thumb, riding on an uneven road at a moderately fast speed you should be able to utilise 85 – 90% of the spring displacement. If you are only able to use less than this value, reduce the resistance of the telescope. If the fork “knocks”, increase the tension of the springs! The above adjustment is most easily performed on telescopic forks operating with air: the air pressure needs to be increased. With steel and plastic suspension elements, the spring displacement can be set within narrow limits, by adjusting the pre-load of the springs. If this is not sufficient, the telescopic fork has to be dismantled and the springs replaced.

If the springs need to be replaced, only use parts approved by the manufacturer. Before performing any modification on the telescopic fork, always read carefully the user guide provided by the manufacturer.
The correct setting of the telescope requires dexterity and special tools. If you would rather not perform this setting by yourself, turn to a specialist service centre!

In elastomer suspension systems the pads must be cleaned and lubricated regularly.

Rear shock

Full suspension systems were first introduced on mountain bikes, but their use is now becoming increasingly widespread on other bicycle types, as well. Similarly to telescopic forks and spring seatposts, rear shocks, too, enhance comfort. To achieve optimal suspension, the rear shock must be set according to your weight and the intended use of your bicycle.
Measure the distance between the bottom bracket of your bicycle and the ground. Next, sit on your bicycle, and ask someone to measure the new distance between the bottom bracket and the ground. Depending on the bicycle's design, 10 – 40% of the maximum spring displacement should be used. The measurement method described above, which uses a cable tie, can be applied here, as well. On air-operated rear shocks the spring action can be hardened by increasing the air pressure. The tension of steel springs can be adjusted by pre-loading or replacing them.
For the adjustment of an air-operated rear shock, a high-pressure pump equipped with a manometer is recommended. If you cannot access the valve of the spring, use an adapter.
You will find the exact method of setting your rear shock in the attached user guide provided by its manufacturer.

Many bicycle types feature several boreholes in which the rear shock can be inserted. By fitting the rear shock in different holes you can make it harder or softer; this will also change the geometry of the bicycle.

Even if your bicycle has a full suspension system, it is not unbreakable. With incorrect use performing jumps or riding over steps or large, sharp stones can cause serious damage to the bicycle, which may lead to the breakage of the fork or frame. Spring shocks have a complex structure. Always leave their maintenance and repair to a specialist service centre!

What to do in case of a puncture?

A puncture need not mean the end of your trip. We recommend that for every bike trip you take a small bag containing the following: necessary tools, spare inner tube, tire lever, patching kit, and a bicycle pump. The best way to carry these is in a small bag attached underneath the saddle.
With V-brakes or cantilevered brakes the brake cable must be disconnected at the brake lever before the tire can be removed. On racing bikes, open the quick-release clamp on the brake body. On hydraulic brakes, the brake body can be fully removed using the quick-release clamp on the brake mount.

ⓘ If the bicycle is equipped with a hub dynamo, do not forget to disconnect the cable!

On bicycles with coaster brakes first undo the screw on the brake lever, then loosen the nuts on the wheel's axle. On bicycles with an external gear shift system, shift to the smallest cog before removing the wheel, to ensure that the derailleur does not get in the way.
If the tire is not fully flattened as a result of the puncture (the rim does not touch the road surface), the puncture was presumably caused by a foreign object (a thorn, for example); therefore, before inserting the new inner tube, you should carefully check the inside of the tire with your hand, and remove any foreign objects from it; otherwise there is a risk that the new inner tube will also be immediately punctured.
It is advisable to prise the tire off the rim starting at the valve. You will need 2-3 tire levers for this. Place one lever approx. 10 cm before the valve, and use it to remove the tire at that point, then insert the hooked end of the lever. You can free one side of the tire by running the other tire lever around the wall of the rim. After this, you can remove the inner tube for the necessary repair.

⊖ Be careful when inspecting the inside of tire, as thorns or shards in it could cause injuries.

Having repaired the inner tube, inflate it slightly. Push the valve through the valve hole located on the rim before replacing the entire inner tube around the rim. To pry the tire back onto the rim, follow the steps of its removal in reverse order. This means that the last part of the inner tube to be inserted into the tire is near the valve.

Very important: before inflating the tire, pull the valve slightly outwards to prevent it from getting stuck between the tire and the rim. Tighten the small screw that secures the valve only after this. Check that the lightly inflated tire runs evenly around the rim before inflating it to the required final pressure.

Patching

Please bear in mind that patching the tire under extreme temperature and humidity is nearly impossible, as in these conditions the vulcanisation process will not take place. In such conditions, carrying a spare inner tube can be an alternative solution.
First, you must locate the hole. This could be difficult if it is too large (it is difficult to inflate the inner tube for the check), or too small (the hole cannot be found). If there is no water available, rotate the inflated inner tube in front of your lips until you feel escaping air – this is where you will need to coarsen the surface of the inner tube with sandpaper (if you have a pen with you, mark the area first). Next, try to apply the vulcanising material in a uniform layer (not too thickly, but covering an area larger than the hole). You can check the extent of its drying with your finger – naturally, do not do this where the patch will be placed. While the vulcanising material is drying, take the tube repair patch and remove the aluminium foil from it, taking care not to get any dirt on its adhesive surface. If the glue has dried, place the patch over the hole, and press it down tightly. The strength applied is more important than its duration of pressing down.

Next, remove the thin plastic film from the centre outwards.
Replace the wheel, following the steps of its removal in reverse order, making sure that it is positioned centrally. Secure the brake and check that the brake pads make contact with the wall of the rim at the same time, and at the correct height.

Remember to check your brakes before your next ride!

Make sure that the mounting and securing bolts/screws are replaced in the correct order and to the correct side. Do not forget to reattach the lighting cable at the front hub dynamo!

Check the tire of your bicycle regularly for wear and make sure to maintain the correct tire pressure. Tires usually wear out on their tread and edges. A badly adjusted dynamo or brake pad or too low tire pressure can damage the sidewall of the tire.

Quick-release skewers (or clamps) and their use

Quick-release skewer


Figure 31


Figure 32

Wheels and seatposts are secured either with traditional hex nuts or with so-called quick-release skewers/clamps, whose use does not require any tools: simply turn their lever, and you can remove the wheel or the seat.

However, this makes this easy for a potential thief, as well, so if the wheel of your bicycle is equipped with a quick-release skewer, always chain the wheel to the bicycle before leaving it unattended. Despite the simple use of the quick-release clamp, accidents do occur, due to their incorrect use.

Make sure that the levers of quick-release clamps are always positioned on the side opposite the chain. This way you can avoid inserting the front wheel the wrong way round.
Attention: with disc brakes, the above rules do not apply. Never fix the wheel with the lever of the quick-release clamp on the same side as the disc brake.

The quick-release skewer fundamentally consists of two handling components:

1. Closing the lever located on one end of the hub exerts a clamping force through a cam.
2. The pre-tension of the axle is adjusted with the clamping nut located on the opposite side of the hub.

For the correct use of the quick-release skewer, follow the steps below:
Open the quick-release skewer. On some models an “Open” marking will assist you with this.
Move the lever in the direction of closing. On some models, the word “CLOSE” is indicated.
The lever should move with ease until about the halfway point of the closing path (it is still not exerting clamping force).
In the second half of the closing path, turning the lever should require considerably greater force. In its final position, the lever must be parallel with the wheel. Check the correct clamping by trying to push the lever forward. If the quick-release skewer can be rotated around, the wheel is not secured correctly. Open the quick-release skewer again and adjust the pre-tension of the axle. Do this by giving a clockwise half-turn to the clamping nut on the other side of the axle. Repeat the closing procedure. Check again the clamping of the wheel. If the quick-release skewer cannot be rotated, the wheel is correctly secured.

Before each ride, check that the wheel is correctly secured. A released wheel during the ride could cause a serious accident!

Lighting


Figure 33/1


Figure 33/2


Figure 33/3

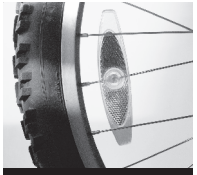


Figure 33/4


Figure 34/1


Figure 34/2

If you ride your bicycle in road traffic, it must be equipped with a correctly functioning lighting system. The lighting system of the bicycle usually operates correctly. In the following, we will present the settings that will allow you to correct eventual malfunctions by yourself.
The voltage required to light the bicycle is generated by the dynamo, from which one cable runs to front and one to the rear lamp of the bicycle. Electric current is conducted to the rear light partly through the metal parts of the bicycle. Current reaches the rear light via the mounting screw of the dynamo, then the frame (or, in some cases, the fender), and finally, through the screws that secure the light. Current may also be conducted back to the dynamo from the light. The best solution for this is use of a double cable.

Dynamos are the classic current generators. The most widespread solution is a dynamo that makes contact with the sidewall of the tire (Figure 34/1). These dynamos are lightweight and easy to attach. For their correct operation, the head of the dynamo must fit precisely to the sidewall of the tire.

Compared to traditional dynamos, dynamos integrated into the hub of the front wheel represent a major technological innovation (Figure 34/2). These dynamos are resistant to adverse weather, practically wear-proof, and highly efficient.

The brightness of the front light can be increased significantly by using a halogen bulb.

On rear lights, the use of diodes is becoming increasingly common (Figure 33/1). The main advantages of diodes over traditional bulbs are their longer service life and lower electricity consumption. Part of the current generated by a dynamo feeds a capacitor, which provides the power supply of the diodes when the bicycle is at rest.
The availability of white diodes makes use of the automatic position signalling function possible on the front light (Figure 33/3).

A new comfort function is available for constantly running hub dynamos. A darkness sensor integrated onto the lamp automatically ensures that the lights operate when it gets dark.
The lighting system can also be set to remain permanently switched on (in case of fog, for example), or off.
Battery-powered lighting systems are also gaining popularity. Please observe your country's applicable regulations.

- Light reflectors also form part of the lighting system.
- You will find details on the light reflectors that must be fitted onto the bicycle in the chapter on “Legislative provisions relating to bicycle lighting”.

Locating malfunctions of the lighting system

First, check the bulbs in the front and rear lights. The filaments of the bulb must not be broken. Black discolouration on the bulb indicates a malfunction. Check that the contacts of the bulbs in the front and rear lights are in order. White or green discolouration on the contact points indicates corrosion. Clean these surfaces with a knife or screwdriver. Trace the entire length of the cable and check whether it is damaged somewhere. Check all connection points – these may also become corroded due to rain or salty water splashing on them in the winter. Pull apart, then reattach contact points.

If the lighting system still does not work after performing the above operations, connect a 4.5 V battery to the lights instead of the dynamo. If the lights work from the battery, the dynamo may be faulty. If the lights still do not work, visit a specialist service centre where they can identify the precise location at which the current supply is broken.

Every bicycle must be equipped with a lighting system. An insufficient and/or incorrectly operating lighting system not only contravenes the law, but poses a life hazard, as well. There is a risk that others participating in traffic will not notice you in the dark.

Luggage rack and carrying luggage

Several possibilities exist for carrying luggage on your bicycle. The method of carrying luggage depends on its size and on the type of the bicycle. Riders of sporty mountain bikes and light racing bikes tend to favour carrying their luggage in their backpack. This way, the extra weight has the least impact on the performance of the bicycle.
Luggage can be attached directly to the bicycle in several ways. On bicycles equipped with a rack, it is recommended that you place your luggage in sturdy panniers. When buying a pannier, make sure that it is waterproof and of suitable quality.
Handlebar bags and so-called “Low-Rider bags” offer even more packing options for bike trips. These bags are attached to the fork through special brackets.

Carrying luggage on a full-suspension bicycle

A child seat may not be fitted onto a rack mounted to the seatpost without support from below. The maximum permitted load for such racks is 10 kg.

If the load is greater, the frame might break!

When loading the bicycle, make sure that packages are distributed evenly. Place heavier objects in panniers, and make sure that the centre of gravity is not too high, and does not have a negative impact on the bicycle's performance.

Carrying luggage will alter your bicycle's performance! Due to the increased weight the braking distance will also lengthen! Practice riding with luggage in a safe location closed to traffic before joining road traffic. Do not overload the racks beyond their maximum load-bearing capacity (stamped into the rack), and do not exceed the maximum load indicated by the manufacturer of the bicycle!
Persons may not be carried on the rack. The frame could break, putting both you and the person being carried in danger of injury. Failure to observe this will void the manufacturer's warranty.

Transporting children on a bicycle

In most cases, children are transported on bicycles using a child seat. Request advice from your distributor in this regard as child seats cannot be fitted onto all frame types!
Most child seats are attached directly to the frame using an adapter, which allows their removal with a few simple movements. Make sure that the child seat does not make contact with the frame, but is located approx. 3-4 cm above it. This way the seat will not transmit the roughness of the road directly to the child. It is important that the seatbelt of the child in the seat is always fastened and that the child wears a helmet.
You should bear in mind that the child seat will affect the performance of your bicycle: due to the weight of the seat and the child the bicycle may wobble more and become unstable. Practice starting and stopping!

When purchasing a child seat, make sure that it complies with the EN 14344 standard. Get advice from your specialist dealer. When riding with a child seat, use of a two-legged kick stand is recommended. Never leave the child in the seat when you stand the bicycle. If the bicycle falls over, the child may suffer serious injuries.

Children may only be transported in special seats which also contain a footrest for them. Children over 22 kg in weight may not be transported on a bicycle. Do not overload the racks beyond their maximum load-bearing capacity (stamped into the rack), and do not exceed the maximum load indicated by the manufacturer of the bicycle! The child seats must safety support the child's feet.

Child trailers for bicycles

Special child trailers offer another option for carrying a child. The child must be secured with a seatbelt and wear a helmet when travelling in a child trailer, as well. The method of attaching the trailer depends on the type of bicycle and trailer.

Before purchasing a trailer – particularly for a full suspension bicycle – ask your specialist dealer whether it can be connected to your bicycle.
The trailer will affect the performance and braking distance of the bicycle. In addition, the width of the bicycle will change significantly, as the trailer projects considerably on both its sides. For better visibility, place a special flag on the child trailer. In the interest of road safety, practice riding with an empty child trailer before using it to carry a child.

Always fasten the seatbelt of the child and have them wear a helmet. Read the user guide of the child trailer. Respect the regulations relating to the maximum permitted weight of the trailer!

Laws relating to child trailers

A bicycle may only tow a child trailer if it has a speed gear in which with one full revolution of the crank arm it travels no more than 4 m. The bicycle must be equipped with a kickstand.

If you are transporting a child in the trailer, you must ensure that they are unable to reach the spokes and cannot get stuck between the rear wheel and the coatguard.

The child trailer must be equipped with the following:

a) on its rear a red, triangular light reflector (light reflector prescribed for trailers) positioned on or to the left of the median plane of the trailer, at a height of min. 0.35 m and max. 0.60 m from the road surface,

b) a rear position lamp identical to that prescribed for the bicycle. The electric switching of the rear position lamp of the bicycle trailer must ensure that switching it on causes the position lamp of the bicycle to switch off.

c) if the trailer is wider than 60 cm, it must be equipped with two rear lights and two white and red light reflectors.

d) trailers have a single axle, and must be equipped with a wheel blocking system that acts on both wheels.

e) trailers used for carrying a person must be equipped with a backrest, a flag mounted on a pole, and a coatguard covering the spokes.

f) the tripod joint must ensure that the trailer stays upright even if the bicycle has fallen over

Fender

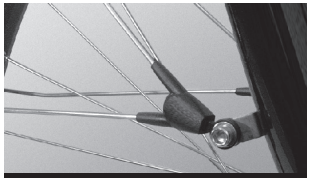


Figure 35

A light reflector prism that falls off or a branch that bounces up from the road could easily get stuck between the wheel and the front fender, which would suddenly block the wheel. To prevent this, fenders are attached not with screws, but with a safety clip that releases the fender in case of danger, which may help avert an accident. In most cases the safety clip can be reattached without any damage.

ⓘ Faulty safety clips or fenders must always be replaced!

Accessories and other equipment

You can increase the enjoyment value and safety of your bicycle with several accessories.

The proper cycling helmet

A cycling helmet must always be part of the basic equipment of the bicycle. A good helmet should be sturdy but not too tight. When choosing a helmet, make sure to observe valid regulations. Another important aspect of the helmet is that its lock should be simple to use and it should fit you well. Even the best helmet will not protect you if it does not hold correctly after a fall and moves on your head.

⊖ Never cycle without wearing a helmet, not even for a short ride!

Cycling gloves and clipless pedals

The sole of a cycling shoe should ideally be sufficiently rigid to offer adequate support for the foot. The heel of the shoe must not be too wide, otherwise it may obstruct a comfortable foot position if it touches the chain stay while pedalling. If the foot is positioned slightly tilted on the pedal to avoid this, it could lead to knee pain. Pedals to which the shoe can be attached with a simply detachable bind offer an invaluably practical solution. The bind ensures that the foot stays on the pedal when pedalling fast or riding over rough terrain. In addition, the foot that is situated further back can exert a pulling force while pedalling, which increases the efficiency of pedalling. One solution is the use of the so-called toe-clip pedals, whose front contains a buckle. Here, the foot is secured with a strap. To ensure the free movement of the foot it is vital that the tightness of the strap is adjusted correctly.
Clipless pedals provide a far more modern and safer solution (Figure 60, Page 15/1). Here, similarly to ski bindings, the bind is provided by using a special shoe. The sole of the shoe contains an integrated metal cleat. Getting on the pedal is very easy. All you have to do is step on the pedal and start pedalling – you will hear a click when the cleat engages correctly. To undo the bind, simply turn the shoe sideways. Practice getting on and off the bicycle several times!

Proper clothing

If you would like to sit comfortably during longer trips, as well, we definitely recommend you to wear cycling shorts or trousers. The rear of these tight trousers contains a special, padded lining. Since one sweats while cycling, it is advisable to wear modern T-shirts/tops made of synthetic materials. The fibres of these materials do not absorb moisture, but conduct it to the outer surface of the top, thus preventing wind chill.

⊖ Never cycle wearing wide-legged trousers, because they could get stuck in the chain or spokes. To ensure proper safety, use clips or bands to secure your trouser legs!

Cycling in bad weather

Those who would like to use their bicycle for touring, as well, are advised to acquire suitable protection against rain. Even the simplest raincoat can serve well for cycling. For longer trips, however, it is better to wear a cagoule and appropriate trousers. Since their wind resistance is much lower than of traditional raincoats, they are less obstructive to progress. Shoes can be protected from water splashing up from the road with various types of gaiters.

Accessories

Electric speedometers may be the most popular of accessories. They indicate precisely current and average speed, daily and total travelled distance, and riding time. When buying extra bells and lighting devices make sure that they comply with legal provisions. Request advice from your specialist dealer! You can also increase your safety by mounting a mirror on the bicycle. Another important accessory is a toolbag containing the most frequently needed tools and a tire repair kit. A bicycle pump will complete your emergency kit.

The proper bicycle lock

Quality padlocks and chain locks offer suitable protection even against theft attempted with the use of heavy tools. They are easy to handle and carry on a bicycle. Make sure that the chain you select is of suitable length to secure your bicycle to an external object (e.g. post). If possible, lock the frame and both wheels!

Riding safely on the road

Many cities try to meet the needs of cyclists by constructing cycle paths and lanes and opening up one-way streets. However, as a cyclist you should be aware that you are one of the “weaker” road users. A bicycle does not have crumple zones, airbags or a safety belt; an accident could, therefore, have very grave consequences. Accordingly, always cycle carefully and with due caution.
By following the advice below, you can greatly increase your road safety:

- Observe the highway code.
- Ride with due caution. Do not provoke or endanger other road users.
- Use existing cycle lanes/paths.
- Do not ride next to another person on a public road.
- Switch on the bicycle's lighting in time before twilight.
- Cycling on dual carriageways and motorways is strictly forbidden and hazardous to life!
- Keep an appropriate breaking distance between you and any vehicle in front of you, as its braking distance is generally shorter than yours
- Always wear a cycling helmet
- Wear light-coloured clothing for better visibility
- Outside populated areas it is compulsory to wear a visibility vest
- Maintain the correct technical condition of your bicycle at all times.
- Do not carry other persons on your bicycle. Exception: children up to the age of 7 may be carried on a bicycle using a special seat. The rider must be at least 16 years of age.
- Children under the age of 8 may only cycle on the pavement.

Certain traffic situations can be particularly dangerous for cyclists. Due to their small silhouette and noiseless passage, cyclists are often hard to notice. The blind spot in the rear-view mirror of vehicles poses particular danger. Drivers cannot see a cyclist who is located in their blind spot. This could be particularly dangerous in the following situations:

- If the car door is opened without caution.
- If a car is making a right turn, crossing over a cycle path.
- If the car or the cyclist is making a left turn.

Other key sources of danger:

- When riding over tramway tracks or sewer grills, tires may slip or get stuck. To prevent this, ride across such areas at a suitable angle. Crossing these surfaces in rain is especially dangerous!

Attention: learn the highway code before joining road traffic. Expect others to make mistakes! In some cases (e.g. nature reserves) off-road cycling is forbidden.

⊖ Be environmentally conscious when riding in nature, and protect natural treasures!

Bicycle care

Your bicycle meets even the most demanding technical criteria. How long your bicycle will continue to operate correctly in technical terms, and how it appears visually depends on its care and maintenance. Regardless of any repair and maintenance you may perform on your bicycle, have it checked regularly at a specialist service centre. This way, you can guarantee your safety and the pleasure of cycling for a long time.

Cleaning and caring for your bicycle

Regular cleaning of your bicycle should be second nature to you. Clean your bicycle gently, using a garden hose (make sure that the water pressure is low) or a bucket of lukewarm water (to which you may add a small amount of mild detergent) and a sponge. Washing your bicycle by hand has one indisputable advantage: it makes it easier to detect any defects. Pay attention to any cracks, deformations or discolouration while washing the bicycle. If you notice any defects on your bicycle, turn to your specialist dealer.

⊖ **Attention:** Do not use a high-pressure water jet to wash your bicycle, because water could get through to its bearings despite the seal, and could dilute the lubricant there, leading to increased friction. If this condition persists for a long time, the rolling surface of the bearing will become damaged as water will be unable to drain off because of the seals. Consequently, the bearing will rust.

Once the bicycle has fully dried, it is advisable to conserve its paintwork, spokes, and hubs with wax. The chain should also be lubricated after the bicycle has fully dried.

⊖ Take care not to get any lubricant onto the brake pads, the sidewall of the rim, or the brake disc (with disc brakes) as this could greatly reduce the efficiency of the brake and endanger your safety!

Storing your bicycle

No special measures are necessary regarding the storage of your bicycle when it is in use during the season. Nonetheless, it is recommended that you keep your bicycle in a dry and well-ventilated space. To ensure that the bicycle survives the winter in a cellar or garage in good condition, you are advised to bear in mind that during a long period of inactivity, the tire pressure of the bicycle will drop. If the bicycle spends a long period of time on flat tires, they could get damaged. To prevent this, either hang your bicycle so that its tires are not under load or regularly check its tire pressure. Before the start of a longer period of storage, we advise that you clean its metal surfaces and treat them with a preservative. Anti-corrosion oil is recommended for this purpose.

⊖ Take care when using anti-corrosion oil: if it gets into the bearings (e.g. in the hub or bottom bracket), it will dilute the grease there. As a result, the lubrication of these bearings will be incorrect for some time!

ⓘ Use the winter period to take your bicycle to a specialist service centre. Waiting times at professional service centres are shortest in the winter.

Technical data

Correct tire pressures by bicycle type

Tire pressure	Mountain bikes	Sport and trekking bikes	City and children's bicycles	Racing bikes
3 bar (45 PSI)	Off-road, on snow or in wet road conditions	–	–	–
3 – 4 bar (45 – 60 PSI)	Off-road	On forest and gravel roads	In cities, on tarmac	–
4 – 5 bar (60 – 70 PSI)	On tarmac	Riding long distances on tarmac	–	–
7 – 9 bar (100 – 115 PSI)	–	–	–	On dry roads

ⓘ The above list only provides an order of magnitude for pressure values. Your riding style, the bicycle itself, and any luggage carried on it can all affect the above values. Pay attention to any different values indicated by tire manufacturers.

Correct tire pressure: conversion from PSI to bar

1 bar = 10– mbar = 1,02 at = 14,5 psi

PSI	bar	PSI	bar
30	2,1	75	5,3
35	2,4	80	5,6
40	2,7	90	6,3
45	3,0	95	6,7
50	3,4	100	7,0
55	3,8	105	7,4
60	4,1	125	8,8
65	4,6	135	9,5

Tightening torques for screw bindings

Use the appropriate tools and torque wrench for any work you perform on the bicycle by yourself. Every bolt and screw on the bicycle is important for your safety – be careful when loosening and tightening them. If you tighten a screw too much, the material will expand and there is a risk that it will break. If it is not tightened enough, the performance of your bike may drop as a consequence. In the worst case, the steering will not work correctly or the wheel will block! Attention: danger of accident!

To avoid this, screws that are important for safety should be tightened with a torque wrench. On these tools, the correct torque can be preset. The unit of torque is the Newton metre (Nm).

Thread	Securing ranges					
	5 .6	Niro 70	Niro 8o	8 .8	10 .9	12 .9
M4	1,7			2,7	3,8	4,6
M5	3,4	3,5	4,7	5 .5	8	9,5
M6	6	6	8	9,5	13	16
M8	14,5	16	22	23	32	39
M10	29	32	43	46	64	77
M12				80	110	135

The minimum insertion depth of a screw is 1.4 – 0.9 times its diameter.
E.g. diameter: M5 => 5 x 1.4 = 7 mm

Bolt assemblies important for safety

Bolt assembly	Torque range	Checks
Securing the stem to the fork tube	Tightening a cone: A-Headset: 8–13,5 Nm (Pay attention to the values indicated by manufacturers!)	doesn't turn?
Securing the handlebar to the stem	11–13 .5 Nm (Pay attention to the values indicated by manufacturers!)	doesn't turn? screws/bolts are tightened uniformly
Brake lever (on racing bicycles)	6–8 Nm	doesn't turn?
Securing the hub to the frame	Axle nut: 20–40 Nm Quick-release skewer/clamp: approx. 90° turn	Is the wheel straight?
Securing the brake cable	6–8 Nm	squeeze the brake lever with full force
Securing the brake body to the frame	At the brake mount: 5–7 Nm Clutch: min . 2 .5 Nm	End of the Bowden cable doesn't get
Brake pads	5–9 Nm	doesn't turn?
Securing the saddle	Nut: 20 Nm Saddle fixing head:: 14–17Nm	doesn't turn?
Securing the seatpost into the seat tube	Saddle fixing screw: 9–12 Nm Quick-release skewer/clamp: approx. 90° turn (Pay attention to the values indicated by manufacturers!)	doesn't turn? Minimum/maximum insertion depth?
Pedals	35–40 Nm	
Crank arm screw/bolt	30–45 Nm	
Chainring screw/bolt	8–11 Nm	
Bottom bracket screw/bolt	50–70 Nm	
Cassette fixing screw/bolt	35–50 Nm	
HG Locknut	30–50 Nm	
Securing the dynamo	In function of screw diameter.	doesn't turn?

Tightening torques for Shimano parts

Part	Description	torque range
Bottom bracket	Left and right shell	50–70 Nm
Cantilevered brake	Fixing screw/bolt for the frame Nut securing the Bowden cable Brake pad fixing bolt/screw	5–7 Nm 6–8 Nm 8–9 Nm
V-brake	Fixing screw/bolt for the frame Nut securing the Bowden cable Brake pad fixing bolt/screw	5–7 Nm 6–8 Nm 8–9 Nm
Rim brake	Fixing screw/bolt for the frame Nut securing the Bowden cable Brake pad fixing bolt/screw	8-10 Nm 6–8 Nm 5–7 Nm
Rear derailleur	Frame dropout fixing screw Shift cable fixing screw Pulley fixing screw	8–10 Nm 5–7 Nm 3–4 Nm
Front derailleur	Clamp fixing screw Shift Bowden cable fixing screw	5–7 Nm 5–7 Nm
Traditional shift lever	Clamp fixing screw	6–8 Nm
Rapidfire	Clamp fixing screw	6–8 Nm
Combined brake and shift lever	Clamp fixing screw	6–8 Nm
Brake lever	Clamp fixing screw	6–8 Nm
Cassette	Cassette fixing screw Fixing ring	35–50 Nm 30–50 Nm
Hub	Quick-release clamp/skewer locknut	5–7,5 Nm
Crank	Crank fixing screw Chainring fixing screw	35–45 Nm 8–11 Nm
Pedal	Pedal spindle	35 Nm

⊖ The above values apply only to Shimano parts and are not applicable for products of other manufacturers!

The bottom bracket is usually screwed into a shell located on the frame.

Shells and threads are available in the following versions:

Thread type	Size	Width of the shell	Rotational direction
English “BSA”	1,37" x 24	68 mm, 73 mm or 83mm	left side: right-hand thread right side: left-hand thread
Italian	36 x 24	70 mm	both sides: right-hand thread
French	35 x 1	68 mm	both sides: right-hand thread in some cases the right side has a left-hand thread

Lighting equipment

Lighting equipment	Volt	Watt
Halogen bulb	6 Volt	2,4 Watt HS3
Traditional bulb	6 Volt	2,4 Watt
Rear light	6 Volt	0.6 watt traditional bulb or diode
Dynamo	6 Volt	3 Watt

List of wearing parts

Chain
The wear of the chain originates in its function. Its extent depends on the frequency of care and on the use of the chain (cycling style, any cycling in rain or on salted roads). Even with regular maintenance the chain will eventually need to be replaced.

Cogs, chainring, and pulley
On bicycles with an external gear shifting system the cogs, chainring, and pulley are exposed to wear due to their function. The extent of wear depends on the frequency of care and on the use of the bicycle (cycling style, any cycling in rain or on salted roads). Even with regular maintenance they will eventually need to be replaced.

Shift and brake Bowden cables
Shift and brake cables require regular care, and sometimes need to be replaced, especially if you frequently store the bicycle outdoors, where it is exposed to adverse weather conditions.

Brake pads
The brake pads of the various brake systems are exposed to wear due to their function. The extent of wear depends on the intensity of the bicycle's use. If you ride your bicycle in a sporty style or frequently on hilly terrain, the brake pads may need to be replaced more often. Check the wear of brake pads regularly, and if necessary, replace them or get them replaced.

Rim
The rim is also exposed to wear, since the brake pads exert their braking action on its sidewall. Accordingly, the wear of the rim must also be checked regularly, for example when you inflate the tire. Small cracks or deformations on the rim indicate wear. With the help of the wear indicator strips on the side of the rim you can check its condition precisely.

Tires
The extent of tire wear depends greatly on your cycling style. Heavy braking that blocks the wheel greatly reduces the life of the tire. It is important that you check the tire pressure regularly.

If necessary, inflate the tire to the prescribed pressure.

Inner tubes
The extent of wear of the inner tubes depends on the frequency with which you check the tire pressure.

Lighting devices and light reflectors
The lighting devices of the bicycle play a key role in terms of road safety; therefore you should check before every ride – especially in the dark – that the lights function correctly. Replace the bulbs, if necessary. We recommend that you keep spare bulbs with you while cycling so that if necessary, you can replace them on the road, as well. Make sure to check the condition of light reflectors, as well.

Grips
If the handlebar grips have worn out and are slippery, replace them.

Lubricants and hydraulic oils
Over time, the applied lubricants and hydraulic oils lose efficiency. Clean and re-lubricate lubricated parts regularly. If the lubricant has been used up, the wear of parts increases, their service life is shortened, and the smooth progress of the bicycle becomes obstructed.

Paintwork
To preserve the appearance of your bicycle, maintain its paintwork regularly. Use a corrector pen to correct minor damage. You can protect the paintwork effectively by applying wax to it.

Headset
Constant bumps and stresses transmitted from the road can lead to the wear of the headset. If you notice any change in the behaviour of the headset, visit a specialist service centre.

Springs/shocks
Observe the maintenance intervals prescribed by their manufacturer.

Proper use and description of bicycle types

City, Junior and children's bicycles

These bicycle types are usually equipped with all necessary accessories, such as a luggage rack, lighting devices, and fenders. Many of these bikes are fitted with a hub gear with a coasting brake. In recent years, great emphasis has been given to the development of bicycles in this group, providing them with such extras as the telescopic fork, hub dynamo, and stem with adjustable angle, which significantly improve their comfort level and the riding experience.
Use: on paved roads and on unpaved roads in good condition.

Trekking bicycles

Trekking bicycles are also equipped with the accessories required for circulating in road traffic. In the interest of their use on longer trips and easier terrain, these bicycles are equipped with 28” tires. By selecting from different tread types (terrain or slick) their use can be customised further. Unlike city bikes, trekking bicycles are equipped with 21, 24 or 27-speed external gear shift systems. To provide a suitable level of comfort, these bicycles may also come equipped with telescopic forks, depending on their design.
Use: on paved roads and on unpaved roads in good condition.

Mountain bike (MTB)

MTBs have become ever more widespread since the late 80's. Their 26” tire size (nowadays 27.5” and 29” tires are also available), knobby tread, external gear shift system, and sporty sitting position all serve their off-road use. The technology used, such as the material and geometry of the frame, has undergone considerable development in recent times. V-brakes, disc brakes, high quality handlebars and seat components offer opportunities for customisation. These bicycles have not been designed for road use. If you wish to ride your MTB in traffic, you must equip it in accordance with legislative provisions.
Use: unpaved roads, terrain

Cross bicycles

Unlike MTBs, Cross bicycles have 28” wheels, although the geometry of their frame and their technical features are similar. Thanks to the larger wheel diameter, Cross bicycles are better suited to training on roads, but they also perform great on easier terrain. These bicycles have not been designed for road use. If you wish to ride your Cross bicycle in traffic, you must equip it according to legislative provisions.
Use: on paved roads and on unpaved roads in good condition.

Racing bicycles (Road)

The structure of racing bicycles serves the goal of achieving high speeds on roads. Their main features are a light, but rigid frame, narrow 28” tires with an almost completely slick tread, a specially design racing handlebar, and low weight. They allow their rider to take up a forward-leaning sitting position to reduce air drag. Technical advances have been taking place in great steps in the area of racing bicycles, as well, with the main developments concerning gear shift and brake systems and other components such as rims. These bicycles have not been designed for road use. If you wish to ride your racing bicycle in traffic, you must equip it according to legislative provisions.
Use: only on paved roads in good condition

⊖ Attention: the manufacturer and the distributor shall not be held liable for damages resulting from incorrect use or the failure to observe the safety technology provisions set out in the user guide / warranty booklet. Correct use includes strict compliance with the manufacturer's instructions relating to use and maintenance. Riding or making jumps on obstacles or steps is particularly dangerous, as there is a risk that the frame and/or fork will break, which could lead to a serious accident. In such cases the manufacturer shall not assume any liability. The manufacturer shall likewise not assume any liability for accidents occurring as a result of participation in MTB competitions or due to improper repairs.

Pedelec
What else needs to be considered in connection with a pedelec?

Electric motor integrated into the rear hub

Central motor

Electric motor integrated into the front hub

If you have purchased a pedelec, you will find the relevant information (e.g. regulations, technical information) in this chapter. Please read also the sections on use and technical details in the user guides issued by the manufacturers of parts.

⊖ Before you place your foot on the pedal, squeeze both brakes of the pedelec. Upon starting, the motor will immediately provide pedal-assist. This momentum might be unfamiliar to you, which in traffic could lead to a fall or an accident.

ⓘ Before taking part in road traffic practice riding your pedelec in a quiet area closed to traffic.

Legislative provisions:

ⓘ Please inform yourself about the applicable regulations of your country!

Ⓓ The pedelec must comply with the legislative provisions relating to traditional bicycles. Use of cycle lanes/paths is also regulated by law.
· The electric motor may only assist progress while the rider is pedalling. In this case, the maximum power of the motor is limited to 250 W, and the pedal
-assist it provides must cut out upon reaching a speed of 25 km/h.
A driver's licence is not required to ride a pedelec, nor is it obligatory to wear a helmet. Nonetheless, wearing an appropriate helmet is advised!

Your pedelec might posses a function that assists pushing it, up to a maximum speed of 6 km/h.

If your pedelec is not equipped with a dynamo: carry the sufficiently charged batteries with you even
if you do not intend to use the electric pedal-assist for cycling.
If needed, the batteries will provide electricity for the pedelec's lights.

Notes regarding the electrical system

Amongst the user guides you will find a presentation from the manufacturer of the drive system. Please read the instructions relating to use, repair, and maintenance carefully. You will also find t here detailed information about technical parameters. If you require any further information, you can find them on the website of the given manufacturer.

The electrical system of your pedelec is highly efficient. In the interest of correct and safe use it is important that it is regularly maintained at your specialist dealership. Remove the batteries immediately if you notice any damage to the electric equipment or if parts of it become exposed following an accident. For any repair or with questions related to the electric system you should always turn to your specialist dealership. A lack of professional knowledge could lead to a serious accident!

Charging device:

- Use only the original charging device.
- The charging device should only be used in a dry location and should not be covered during its operation. Failure to observe this could lead to a fire or a short circuit.
- Always disconnect the charging device from the power supply before cleaning it.

Maintenance and care

- Only the specialist dealership may perform maintenance and care operations on parts that conduct electricity!
- Use only factory originals or parts approved by the manufacturer as replacements on your pedelec. Failure to observe this will void the warranty and liability.
- Remove the bateries from the pedelec before cleaning it.
- When cleaning the batery, make sure that it does not touch any cconducte surfaces, as this could injure you and damage the batery!
- Use of a high-pressure water jet for cleaning can damage the electric equipment, as due to its high pressure, water could get inside even insulated components.
- Take care not to damage cables or any other components. In case of any damage, get your pedelec examined by your specialist dealership. Following the damage the pedelec may not be used until it is xamined!

Wear and liability

Please bear in mind that the parts of a pedelec are exposed to greater wear than those of a traditional bicycle without electric drive. The reason for this is the greater weight and higher average speed of the pedelec. A higher rate of wear does not constitute a defect of the material, and the warranty does not cover it.

Parts most exposed to wear:
- Tires
- Brake pads
- Chain
- Spokes

The battery also ages, and is therefore considered a wearing part. Bear in mind that over time the battery will lose from its capacity. Consider this when planning a trip and take a spare battery with you, if necessary. You can purchase a spare battery from your specialist dealership.

Special regulations for S-pedelecs

If the electric pedal-assist enables the vehicle to reach speeds over 25 km/h, the vehicle is called an S-pedelec, which requires a type-approval certificate / individual circulation permit.

The internationally valid regulation is:
(D)
- An S-pedelec is legally regarded as a moped
- When driven only by its motor its maximum speed may be 20 km/h
- The pedal-assist provided by its motor must cut out at 45 km/h
- A helmet is not compulsory to ride an S-pedelec, but is recommended!
- Holding a driver's licence for a moped is compulsory.

Riding an S-pedelec on cycle paths

If you are riding your S-pedelec without its pedal-assist motor, like a normal bicycle, you can use all cycle paths without restriction.
When using the motor, please bear in mind the following:
Outside populated areas you must use cycle paths, similarly to mopeds. If this is not permitted, it will be indicated.
Within the boundaries of populated areas a separate traffic sign will inform you of the possibility of using cycle paths.

Speed switch

The pedelec is equipped with a speed switch.
Using only its motor, without pedalling, the pedelec is capable of reaching a speed of 20 km/h, as controlled by the speed switch.

The pedal-assist provided by the motor allows more intense acceleration than the familiar, pedal-only drivetrain.
Please bear this is mind when riding a pedelec – especially if it's a new one!

Replacing parts of an S-pedelec

Parts that can be used on specific models are defined through an approval process. This means that the individual circulation permit / type approval certificate will only remain valid if approved parts are installed. When installing replacement parts, make sure that they have been approved; otherwise obtaining a unique type approval certificate becomes necessary.

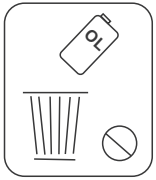
Parts which may only be replaced by OEM or approved parts

1. Frame
2. Fork
3. Motor unit
4. Battery
5. Tire
6. Rim
7. Brake
8. Front light
9. Rear light
10. Registration plate frame
11. Side kickstand
12. Handlebar
13. Stem

ⓘ If you mail the battery of your pedelec as a package, you must observe certain regulations. Please inquire about these regulations from your specialist dealer or the manufacturer.
When transporting your pedelec by car, you must always remove its batteries and transport them separately!

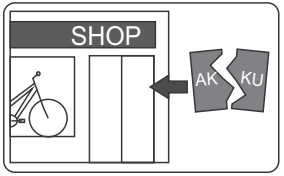
Environmental protection tips

General cleaning and care products
Protect the environment when cleaning and caring for your bicycle, and if possible use biologically degradable cleaning agents. Take care not to release any cleaning or care products into the sewer system.
Use appropriate chain-cleaning equipment for cleaning the chain.



Brake cleaners and lubricants
Follow the same precautions with brake cleaners and lubricants as with cleaning and care products.

Batteries
Batteries are hazardous waste.
Return used batteries to your specialist dealer or the manufacturer.



Software

The e-bikes are assembled and programmed by the factory, any changes in firmware or reprogramming of e-bikes must be done by the official services of system manufacturer.
Any modification of electrical system or cables, connectors, sensors that are performed by persons who have not been authorized by system manufacturer is strictly prohibited and dangerous. Any case of hardware modification or tampering with firmware will automatically reject the coverage of warranty and in such a case the factory shall shift all responsibility to owner of ebike.

General description of PEDELEC system

Installation of assist system:

·Wrap the bycicle out (think about selective collection of waste)
·Install the pedal and adjust the handlebar, seat height, brake levers and brakes (these operations accord to normal bicycles. For more information check page 6 of Users Manual)

Please download the user manual for the electric system from:

https://www.gepida.hu/en/support/guides-manuals/

https://www.bosch-ebike.com/us/service/downloads/

Select the instruction manual for the appropriate electrical system and read it carefully!

-Bosch system

- Take the display out of the box and fit it to the holder at the middle of the handlebar. Make sure that the display in right position. (Important to keep the bright interfaces clean on the holder and the back side of the display.)
- Take the key and battery out of the box.
- Unlock the battery lock. (The key is irremovable from opened lock. If you can't unlock, check that the key is fitting to the lock.)
- Insert the battery. (Important to keep the interfaces clean on the holder and battery!)

-Bafang system

- Take the display out of the box and fit it to the holder at the middle of the handlebar. Make sure that the display in right position. (Important to keep the bright interfaces clean on the holder and the back side of the display.)
- Take the key and battery out of the box.
- Unlock the battery lock. (The key is irremovable from opened lock. If you can't unlock, check that the key is fitting to the lock.)
- Insert the battery. (Important to keep the interfaces clean on the holder and battery!)

Uselage of PEDELEC

- Check the battery capacity before ride to make sure that the bicycle is able to take the expected distance. (suggestion: use the bicycle in lower assist level if the road conditions allow it.)

- Bosch system /2013-2016/

- Turn on the assist system by ⏻ button
- Switch assist level by +,- button.

- The assist starts when the pedal gets forced on.
- The system functions also as a bicycle computer and displays clock, averange speed, maximum speed, toal and daily mileage.
- The assist immediately stops when the pedaling ceased so the rider can brake or slow down.

Improper way of using:

- Don't touch the buttons of the display positioned to the midle of the handlebar during ride because it is unsafe. Stop the bicycles for settings.
- Children are carriageable under weight 22 kg only in child carrier what according to DIN 79120 standard.
- Be very careful on slippery roads because of the extra torque of the bicycle.

Service:

- The motor doesen't need maintenancetherefore don't remove the motor cover!
- Use original parts only!
- The parts are changeableto the specified parts of the bicycles only! Ask for help at the local bicycle dealer.
- Don't leave the batteries in direct sun (Shopwindow, carwindow, open areas, etc.)
- In case of the battery would flare up or heats quickly up, start to cool the battery down and keep it in non flameable environment. (under sand for example)
- Store damaged batteries in non flameable environment. (under sand for example)

- Bosch system
- Find the explanation of error codes of Bosch users Guide.
- If the LED 1,3 and 5 is blinking on the battery, the system is out of operation temerature interval (<0oC or >40oC). If the LED 2 and 4 is blinking, the battery detected failure and the system shuts down.
- Charge the battery after ride and store separately from the bicycle.
- Sore at dry place between 5oC -20oC.
- Don't leave the battery on charger for long time (days)
- Optimum storing capacity: 50-60%
- Don't store the battery near to radiant heat.

Transport by car:

- Note that the weight of PEDELEC is more than normal bikes have.
- Make certain of strength of the carrier before set up.
- Use certificated bicycle carrier only.
- Remove all parts from the bicycle what can fall off during transport.
- Take the batteries out of the bike during transport.
- Always make sure that the bicycle is fixed to the carrier stably.
- Our company does not take the responsibility for any damages during transport.

Warranty

Date of notice:
Date of receiving:
Cause of problem:
Method of repair:
Date of return:
New date of the warranty:
Name of service:
Worksheet nr.: .....

Date: ……..... .....
Sign, stamp

Warranty

Date of notice:
Date of receiving:
Cause of problem:
Method of repair:
Date of return:
New date of the warranty:
Name of service:
Worksheet nr.: .....

Date: ……..... .....
Sign, stamp

Warranty

Date of notice:
Date of receiving:
Cause of problem:
Method of repair:
Date of return:
New date of the warranty:
Name of service:
Worksheet nr.: .....

Date: ……..... .....
Sign, stamp

REGISTRATION PAGE

Model name

Dealer

Distributor

Manufacturer Olimpia Kerékpár Kft.

ATTENTION!

The bicycle will be assembled and installed for safe use by the dealer at the point of purchase, what is proven by the dealer's stamp and signature.

Completed by the dealer!

Purchaser name / address

Date of purchase

Frame no. GE

ID number

Stamp / signature of the dealer

Any lost Warranty Card will be replaced with credible proof of purchase only – dated and stamped invoice, etc.! Any warranty claim is valid with the Warranty Card. Retain your Warranty Card attentive after the warranty period as well. The suitable part of the bicycle for identification: the frame.

CERTIFICATION THE OBLIGATORY CHECK

CHECKAFTER 1 MONTH/	CHECKAFTER 6 MONTHS/
DATE :.....	DATE :..... .....
.....	.....
Signature, stamp/	Signature, stamp/

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