

# FIVE

Fabbrica Italiana Veicoli Elettrici

Italwin

WAYEL  
Electricbikes



## Pedal Assist Bicycles

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Pay particular attention to this symbol.

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

## 1 INSTRUCTIONS FOR USE

Thank you for purchasing electric bicycle produced by FIVE - Fabbrica Italiana Veicoli Elettrici -, an intelligent response to the need for alternative mobility, which will allow you to reach your workplace, the old town centres, the limited traffic zones, without suffering the limitations of motor vehicles, without polluting, noiselessly, without getting sweaty or tired, at a much lower cost. The electrically pedal assist bicycle adds to your muscular thrust the thrust of an electric motor, allowing you to go faster with the same effort or make less effort with equal speed. As soon as you start to pedal, a control unit detects the electrical signals generated by the pedaling sensor, and (if available) of effort sensor applied to the pedals. In this way, the power output of motor mounted inside the wheel hub or in place of the pedals' bottom bracket is controlled. The electric pedaling assistance is reduced, and then resets when reaching 25 km/h, according to the law. The energy is supplied by a rechargeable battery positioned on the bicycle. According to the law, this electric bicycle is equalized to a normal bicycle. Therefore, it benefits of all the advantages of normal bicycles' use for road traffic, in limited traffic zones and cycle paths; moreover, it is not subject to insurance or road taxes. Like normal bicycles, also the pedal assist bicycle needs regular maintenance to keep in working order and safe over time. We recommend that you read these instructions carefully, to use the bicycle with greater security and satisfaction. Should you have any doubt or question, always contact the dealer where you bought the bicycle. Please keep this manual within reach for future reference, but keep in mind that many operations of ordinary and extraordinary maintenance require specific mechanical skills, that go beyond the basic capabilities of normal user.






**WARNING! Do not modify or manipulate or tune up your bicycle. Risk of accident! Modifications and manipulations will render the warranty void, moreover the bicycle will be no longer approved for use according to the law.**


### 1.1 Intended use

FIVE pedal assist bicycles have been designed for normal use of riding on the road with asphalt in good conditions. Therefore, it is not suitable for sporting use, off-road, acrobatic, business, professional and anything else that constitute an abuse or subject the bicycle to abnormal stress, which should shorten its life cycle or may even cause a sudden structural failure.


On the contrary, the sports line products are suitable to the use also on white roads and light off-road. See below the table that classifies FIVE bicycles in consideration of the conditions of use classified according to the European standard EN 17406. The user of the Five bicycle is required to respect the condition of use relating to his bicycle. Failure to comply with these conditions may cause serious accidents and damages that are not covered by the warranty. The pictogram relating to the condition of use is also shown on the bicycle frame.

<b>FIVE bicycle model</b>	<b>Condition of use according to the European standard EN 17406</b>	
Urban, Foldable, With 20" wheels, Fat, Trekking	Condition 1: bicycles for everyday use with moderate effort, in urban areas, on roads and cycle paths. It is not an off-road bicycle and it is not suitable for competitions or jumps. It is not intended for use under categories 2, 3, 4, 5 and 6 of the same standard	 EN 17406
Trekking, SUV, Sport	Condition 2: includes condition 1, and it also concerns bicycles for use on unpaved roads and light dirt roads. It is not an off-road bicycle, and it is not suitable for competition or jumps. It is not intended for use under categories 3, 4, 5 and 6 of the same standard.	 EN 17406
Sport	Condition 3: includes conditions 1 and 2, and it also concerns bicycles for use on rough terrain, dirt and uneven roads, difficult terrain and unmarked paths and whose use requires technical skills. It is not intended for use under categories 4, 5 and 6 of the same standard.	 EN 17406

The maximum capacity (biker plus any extra load) is 90 kg.

 **WARNING!** In case Five bicycle is equipped with a rack, it is always necessary to check its maximum load capacity, indicated on the rack, and never exceed it.

## 1.2 Life cycle – periodic safety inspection

 **WARNING!** As with all mechanic objects, also the bicycles are subject to various forms of wear such as consumption, surface wear, material fatigue, oxidation, etc.. Each part of the bicycle has a finished life cycle that depends on many factors such as the conditions of use, the period of use, the user's weight, the distance traveled, the road conditions, etc.. To reduce the risk of accidents, the bicycle must be regularly inspected in all its components, and each component must be replaced before the end of its life cycle.

You need to agree with your dealer a reasonable time interval between inspections, according to the real extent of the stresses to which the bicycle is subjected.

The periodic checks must be carried out throughout the bicycle's lifetime regardless of any question relating to warranty, because their aim is first to increase the bike's safety.

## EN 2 MECHANICAL PREPARATION OF THE BICYCLE

### 2.1 Position of the bicycle

The bicycle position is particularly important for its safety, for riding comfort and for avoiding physical problems; it is necessary that the position of seat and handlebar are adjusted according to your physiognomy and riding preferences.

### 2.2 Seat

The bicycle seat supports the user's weight (with all the pressure concentrated in a rather small surface) and dampers the stresses caused by road irregularities. We choose seats with superior characteristics, to ensure a good comfort to most users; however, it may be necessary to replace the component with a different product, to meet your requirements.

### 2.3 Seat adjustment

The saddle can be adjusted in height, in moving forward and in angle. To modify the saddle's height, it is needed to loosen the collar that tightens the seat tube in the frame, and then carry out the adjustment according to your requirements. Pull up or push down the saddle, with a slight twisting motion if needed, to facilitate the passage of the seat tube in the frame. As a general indication, the height of the seat is correct if your leg is almost fully extended, when your footrests on the pedal at the lowest point of rotation. The movement of the legs should be natural, and should not cause muscle or joint pain. The collar must be tightened so that the seat tube does not move inside the frame; in case of movement, it is needed to further tighten it and repeat the test.



**WARNING!** The seat tube must be inserted into the frame for a minimum length indicated by the marking IIII to prevent even sudden collapses during use. If this marking protrudes from the frame, the tube is not inserted sufficiently, so it might suddenly break causing an accident.

To adjust the angle of the saddle and to move it forward or backward (by sliding the seat frame in the seat tube bracket) according to your preferences, loosen the screw under the seat, then adjust the moving forward and the angle of the saddle. In the end, firmly tighten the screw, so that it cannot play any movement whatsoever.



**WARNING!** It is essential to properly tighten the screw locking the saddle, to avoid accidents caused by the breaking of the saddle itself, by a sudden movement of the saddle, or by the breaking of the seat's frame.



**WARNING!** It is required to avoid extreme positions in forward or backward of the saddle, to prevent the saddle and seat tube from breaking, and causing an accident. You must repeat these operations until the saddle is perfectly adjusted in your correct position.



**WARNING!** If the saddle is badly adjusted, it may cause circulatory disorders that emerge with pain or loss of feeling in the pelvic area. Set the saddle to avoid any physical disorder.

In the rare case where, regardless of the adjustment, the disturbances were to persist, it is advisable to use a specific seat for the prevention of this type of pathology. If in doubt, seek medical advice immediately and temporarily suspend the use of bicycle.

### 2.4 Handlebar adjustment

On some models, the handlebar may be adjusted in height by loosening the screw that secures

the stem within the fork tube; on other models, the stem is fitted with a joint that allows the adjustment along a circumference arc.



**WARNING!** If in regulating the height of the handlebar, the stem was pulled out from the fork tube beyond the specified limit, this would cause its removing or sudden breaking during use.

**To avoid a serious accident, please respect the specified limit.**

On all models, the handlebar can be rotated on the transverse axis, by loosening the retention system that secures it in the stem, to optimize the handgrip according to your riding position, physiognomy and individual preferences. In case of need, the handlebar and stem have a standardized interface size, so you can always replace them with other products - for example, if you wish a handlebar with different width or different shape.



**WARNING!** The stem must be adequately secured to the fork tube, to prevent it from rotating or slipping off during use, causing an accident.

## 2.5 Adjustment of the brake levers

The brake levers must be oriented to maximize the ergonomics, minimizing the force to be applied while still maintaining the possibility of having a good modulation of the braking. As a rule, the brake levers appear to be oriented downwards and substantially aligned with the forearm, to facilitate a natural and spontaneous position of the fingers. In the event of emergency braking, fingers must immediately and instinctively find the lever, being able to develop enough force. If your bicycle is equipped with mechanical disc brakes or brakes acting on the rims, with the progressive consumption of the shoes or pads respectively, the levers will require a longer stroke to exert the same braking force. To compensate for this type of wear, it is needed to regularly act on the cable adjustment nut located behind the lever, to restore the optimal conditions.

On the other hand, if your bicycle is provided with hydraulic disc brakes, it is important to periodically check the wear of brake pads, sighting them by a transverse position with respect to the rotation axis of the wheel.

It is essential to carry out this inspection with greater or lesser frequency based on average usage time of the brakes. The average time increases considerably in the case of frequent use of the vehicle at full load, city routes which require frequent stops and starts, routes characterized by ups and downs and/or flyovers.

The hydraulic brakes are equipped with a system of valves which automatically compensates for the wear of the pads, constantly guaranteeing the maximum braking efficiency. However, the verification of the pads' wear is not noticeable during the use of the brakes and is therefore at the user's care.

## 2.6 Gear ratios

The combination(s) of the gear ratios have been selected to suit most situations. If the metric development of the ride was not suited to your specific needs, your dealer can mount pinions/cassettes of your choice, offering the desired ratio.

## 2.7 Tires

The tires have been selected to satisfy most needs; if your particular use requires different tires, we recommend that you make them replaced. For example, with large size tires you will have more comfort (thanks to a wider surface and a lesser pressure per unit area) but also a greater friction and more energy consumption. Otherwise, with lower section tires, you will have less friction and more range (thanks to higher pressure per unit area), but less comfort as well.

If you want a greater traction - for example for winter use - or a greater grip on wet roads, we recommend to mount tires with a different tread pattern or tender compounds, in relation to the ground you intend to make greater use of the vehicle.

## 3 BEFORE RIDING THE BIKE

### 3.1 Check before each use

- The bicycle must be controlled in all its parts, to make sure that all the components are not excessively worn or have structural damage: they must be well fixed and must have no play or abnormal movement.
- The battery must be charged (if you intend to use the electrical assistance), properly mounted and secured to the frame by the special locking device.
- The operation of the brake levers and the thickness of the shoes and/or the brake pads must be checked, referring to the wear indicators; the residual thickness must be sufficient to the use that will be made of the bicycle.
- As the shoes and/or the pads of the mechanical brakes are consumed, it is necessary to act on the adjusting nut by moving the shoes close to the rims or the pads close to the disc, to maintain unchanged the braking power. This operation is not needed for the hydraulic brakes, but it is essential to check the state of wear of the pads. When the maximum wear limit is reached, it is necessary to replace the shoes and/or the pads immediately.
- The braking surfaces (the sides of the rims) and/or the discs, as well as the brake shoes and/or the brake calipers must be cleaned, degreased and free of inclusions. It is necessary to check the proper tightening of the brake screws, the fastening screws of the shoes and of the calipers as well as the cable clamping nuts.
- The cables must be in good condition, and must not have fraying or sliding friction. It is needed to pull the brake levers and check that they return to the rest position as soon as they are released, without uncertainties.
- The two brakes (front and rear) must be properly adjusted and in perfect condition. In this way, the maximum safety of the vehicle is guaranteed, thus also reducing the risks caused by small inconveniences: if suddenly one of the two brakes do not work - for example due to the breakage of a cable or a leak in the hydraulic system - the other brake would be still able to slow down the bicycle safely.
- Please check that the seat is properly tightened, preventing movements or play; the collar fixes to the frame the seat tube, which must be tightened to prevent movements of the tube itself. The saddle and the seat tube must constitute a unique and solid totality with the frame.
- It is necessary to make sure that the handlebar rotates without friction or play; check the proper tightening of the handlebar to the stem, and the stem to the fork tube. The eventual adjustment of the handlebar set must be performed by a qualified dealer.
- It is necessary to make sure that the wheels are properly aligned, and well fixed to the frame; if the bicycle is lifted from the ground, the wheels must turn freely without friction, and must not skid sideways. The rims rotating, they must not have any significant radial or axial oscillation.
- It is needed to check that the tires are under pressure and that the tread is not consumed; the inflating values vary with the type of tires fitted, with the diameter of the tire (greater diameter = lower pressure) and with the user's weight (greater weight requires higher pressure). The maximum pressure is indicated on the side of the tire. Deflated wheels facilitate puncture, quickly consume the tires and significantly increase the resistance to the forward movement of the bicycle, thus reducing the battery's range.



- It is needed to check that the pedal cranks have no play; the fixing bolts of pedal cranks must be properly tightened. The pins of the pedals must be securely screwed and tightened in the cranks.
- It is necessary to verify the correct operation of the lighting system. In case the bicycle is equipped with the dynamo it is necessary to verify that it has no play and exerts proper pressure on the tread. If the dynamo should exert a greater or lesser pressure than expected, it may cause premature wear of the sidewall of the tire or of the mast head of the dynamo itself.
- The chain must always be tensioned correctly, oiled and in excellent condition.
- If your bicycle has suspension, you need to check if the spring elements retract and extend as usual.



*Always be careful!*

*Should you have even a single doubt, avoid riding the bicycle and face the problem with your dealer.*

### 3.2 Become friendly with the electric bicycle

Initially, the electric assistance given by the motor can take you by surprise and create a slight discomfort, especially if accelerating and bending in confined spaces such as the limited traffic zones where pedestrians often occupy the roadway. Therefore, for the first time, we recommend to always select the minimum level of assistance. Do not use the vehicle on the road without first becoming friendly with this type of bike in an area closed to traffic. The greater weight of the electric bicycle requires more attention especially in low speed manoeuvring or when the bicycle is accompanied by hand. If you will use the bicycle with additional loads, it will be even more important to do adequate experience before.

## 4 RIDING THE ELECTRIC BIKE

### 4.1 Clothing, caution helmet, knowledge of the rules

To reduce the risks arising from the public highway, with the electric bicycle there are the same precautions of regular bike, such as:

- use a helmet;
- wear high visibility clothing;
- be careful;
- avoid your mistakes so you can also limit the consequences of other people's mistakes.

Knowing and respecting the Highway Code is essential. In general, the clothing must maximize the visibility of the rider and allow maximum freedom of movement in such a way as to have the perfect control of the bicycle. Moreover, fluttering clothes must be avoided, which could get trapped in the bike's components (mobile or stationary) or got caught by the vehicles passing by you. Shoes with a high heel and long scarves must be avoided too. Always holding the handlebar with both hands helps you to deal with any emergencies, while listening to music does not allow you to perceive any signs of danger. The use of eye protection is recommended.

### 4.2 Handlebar display

The handlebar display may be of LED type or LCD type equipped with control panel, according to the model of bike you purchased.

The status of residual charge indicated by the bike's display and battery display, may also vary cases according to the instantaneous power input of motor, which causes a voltage drop.

However, this is to be considered as only indicative information.

By the display and the control panel, it is possible:

1. to modify the desired assistance level;
2. to use the soft start/easy walk function (on compatible models);
3. to turn on/off the lighting system (on compatible models);
4. to switch on/off the bike.

To download the specific manual of the display used on your electric bicycle, consult the website [www.italwin.it/download](http://www.italwin.it/download), [www.wayel.it/area-download](http://www.wayel.it/area-download).

### 4.3 Range

Many factors determine the actual range of the electric bicycle. Knowing them will help you to identify and remove the causes of a range lower than expected.

The most important factors are the following:

1. the extent of muscle contribution added to motor assistance;
2. the selected level of electrical assistance;
3. the type of route (uphill, downhill, acceleration-braking);
4. the tire pressure (but also the type of tread, compound, size);
5. the mass of the rider and any additional load;
6. the presence of a headwind or crosswind to the riding direction;
7. the ambient temperature (which affects the efficiency of battery and motor);
8. the conditions (conductivity) of the electric contacts;
9. the real capacity of the battery (conditions of use and cycles already performed);
10. the mechanical conditions of the bicycle (state of cleaning and oiling, friction entities, wear).

### 4.4 Battery's removal and insertion

The battery can be removed from the bicycle to prevent theft, for charging or to be stored in optimal conditions. Using the supplied key, unlock the retention mechanism and remove the battery from the battery case (housing/battery holder).

For the insertion, in the reverse order, insert the battery into the battery case and block it with the special key mechanism. After operating the battery lock, remove the key ensuring that the battery is rigidly fixed. A removing test is the best check to ensure that the battery is properly blocked.

### 4.5 Electrical assistance

With the battery charged and properly inserted, depending on the model of bike and battery, the electrical assistance can be activated:

- activating the battery by the special switch (if available);
- turning the turning on key (if available);
- activating the electrical assistance from the display (if available) by I/O button.

On most models equipped with a display, a selector allows you to choose the level of the electrical assistance, which will start as soon as you start pedaling, and stops when you stop to cycle. A slight delay in the system response is quite normal and is due to the minimum time during which the pedals must turn so that the electronic system recognizes that the user intends to pedal. This averts undesired starting of motor, in case the pedals are unintentionally hit, for example by conducting the vehicle by hand. The choice of the electric assistance level affects the travel range: the greater the power, the greater will be the battery consumption, resulting in a decrease of range. Whatever the selected level, the maximum speed that can be reached depends on muscle strength expressed by the user. For more trained users, muscle power may

also be greater than the power of the electric motor, limited by law. In any case, the current legislation allows the intervention of an electric pedal assistance, only up to 25km/h. For these reasons, at higher speeds the propulsion will be just of muscle type. You must remember to always turn off the electronics when you stop to use the bicycle, to avoid the damaging total discharge of batteries. Anyway, the bike can be perfectly used, with the sole muscle strength, even if the electronics is turned off and without battery.

#### 4.6 Gearbox

The gear change (for models equipped of gear) is carried out as for normal bicycles, acting on the appropriate controls to the handlebar. To increase the longevity of the transmission and avoid damage to the gears, the gearbox and the chain, it is necessary to reduce the thrust on the pedals whenever you make a gear change. The brakes are constructively like the brakes of a normal bicycle, but incorporate an electronic sensor that instantly stops the power supply to the motor when you act on the lever.

This feature is extremely important so that the electrical assistance is suddenly turned off regardless of the reaction time of the user - for example in case of emergency braking - who has not completely stopped to pedal.

#### 4.7 Speed sensor (if available)

The speed sensors are installed on all bicycle equipped with motor to the hub. The reading of the pedals' rotation takes place thanks to an electronic Hall effect sensor fixed to the frame, that detects the magnetic field generated by magnets: the magnets are arranged on a phonic wheel keyed on the hub of the pedals' bottom bracket, which rotates together with the pedals themselves. On some models, the phonic wheel is separated from the sensor and the system could be affected by the eventual entry of dust or dirt. Consequently, it is necessary to clean the magnetic disc regularly, and in case of abnormal operation of the electrical assistance. Moreover, the correct alignment of the disc with respect to the sensor must be periodically inspected. For this operation, you may need to contact your dealer. If the phonic wheel is not correctly aligned with the pedaling sensor, an intermittent operation of electrical assistance could appear.

#### 4.8 Torque sensor (if available)

Sensors of this type are installed inside the motors to the bottom bracket, and then on the models provided with them. This type of sensor can detect, in addition to the rotation of the pedals, also the muscle force exerted by the rider on them. Therefore, the control unit performs an interpolation of data coming from the two measuring systems, and regulates the supply of power to the motor as a function of them. In this way, it is possible to obtain an electric power modulation that perfectly reflects the variations of muscle power applied by the rider. This allows for more natural and responsive assistance, appreciated especially uphill. However, it should be applied a less intense effort to get help from the engine.

#### 4.9 Riding the electric bike



**WARNING! When mounting your bicycle, make sure not to step in the pedals until you sit in the saddle and grip the handlebar tight, and that one pedal is at the lowest position when you get on. The motor assistance might switch on suddenly and result in an uncontrolled start of your bicycle.**

Before leaving, place the stand (if available) in the horizontal rest position. The electric bicycle is used as a normal bicycle, but as already highlighted, it must be considered that the thrust of the electric motor has always a slight delay with respect to the pedal. So please be always careful,

with special attention in particular in the most difficult conditions: rain, poor visibility, ground with poor adherence or uneven roads, wind, heavy traffic, dark, extra load, and so on. If the conditions are particularly severe - such as high winds, snow or ice, poor visibility - using the bike would be too dangerous. The electric bicycle has a volume greater than that of a normal bicycle, and therefore requires greater care.

Consider that, on wet ground, the power of the brake system decreases, the braking distance increases and the roadholding decreases. You should therefore anticipate braking and be more careful. Never proceed alongside other bikers, and where possible, use the lanes reserved for cyclists. Always indicate early enough your intentions to other road users. If you brake, stop to pedal as soon as possible. Otherwise, in addition to the inertia, the brakes must also win the muscle strength, with even longer stopping distances and increased wear.

#### 4.10 Washing the electric bike

After removing the battery, the electric bicycle can be washed (having the necessary care for the electronic parts) with a soft cloth and water, with the possible addition of some drops of neutral detergent. After washing, it is important to dry all the washed components, as well as the frame, with another soft dry cloth. Never use pressure washer, as the water jet can penetrate inside bearings, mechanisms and electric circuits, damaging them irreparably. The washing is particularly necessary if the bicycle is used on salted roads. After washing, all exposed electric components must be disconnected and protected/restored with the special anti-corrosion spray. Solvents, thinners or hydrocarbons must not be used. The braking surfaces of the rims must be thoroughly cleaned and degreased with substances that are not oil-based. In case of rain, it is good practice to clean both the brake shoes and the rims after each use.

## 5 BATTERY

### 5.1 Compliance

The batteries used are composed of Lithium-Ion cells, and conform to European safety standards: **EN 15194, UN 38.3**. The tests were performed as Lithium batteries cannot be considered free from flammable.

Charge in a ventilated place using the supplied charger only.

1. Connect the charger's plug to the battery.
2. Turn on the battery.
3. Insert the plug into the socket. The charger LED turns red.
4. When the LED turns green, the battery is charged.
5. Disconnect the charger from both the socket and the battery.



***Do not recharge the battery in the presence of environments and flammable materials.***


***Do not recharge the battery in the presence of children.***

***Always charge the battery under direct supervision and only with the charger supplied with the bicycle.***

***Do not use defective batteries or chargers under any circumstances. If you have any questions or concerns, please contact your dealer.***

### 5.2 Battery's storage and recharging


Store the battery in environments at temperatures between 10°C and 25°C, not exposed to direct sunlight and away from heat sources. Store the battery in a range between 60-80%, and in any case charge it at least once every month. Do not store the battery near flammable materials. Keep out of reach of children.

 **Do not open for any reason the battery casing, on pain of loss of warranty!**  
*Although it is not in use, charge the battery at least once every month, on pain of loss of warranty!*

### 5.3 Conditions of use

Before use, switch on the battery by the button on the left side thereof. To check the charge status, press the button on top of the battery. 4 lit LEDs indicate the 100% of the charge. Max relative humidity 95%.

- Do not open the plastic casing.
- Do not subject to mechanical stress (weights, shocks, etc.).
- Do not expose to fire, heat, acid or alkaline substances. Do not wet with water.
- Wipe with a damp cloth.


 **If the battery gets too hot, or has any signs of damage, immediately contact your dealer.**  
*The use and charging in the presence of these signs can be dangerous to people and property.*

*Incompatible battery chargers (chargers different from the one supplied with the bicycle) may damage the battery and compromise safety.*

## 6 MAINTENANCE

In order to ensure safety standards and functionality over time, your vehicle needs regular periodical maintenance. Some maintenance works are available to anyone having a good mechanical aptitude and manual dexterity, and owning the necessary tools. Other operations require specific expertise and the tools of a qualified reseller. Your dealer can help you determine which action is within your reach and which is not. It is especially important to establish with your dealer the rate of maintenance interventions, based on the use that will be made of the bicycle. Should you have any doubt or question, always contact your dealer. Keep in mind that no one else than the biker can better detect certain weak signs of functional abnormalities that might cause technical problems or a reduction in safety. It is therefore essential that you pay due attention to the bicycle, while going regularly to the dealers.

### 6.1 Fatigue of materials

 **WARNING!** As explained in the introduction, the various parts of which the bicycle is composed (frame, wheels, handlebar, etc.) are subject to different forms of common wear, and to a less well-known wear called "fatigue of materials". The "fatigue" occurs in materials subjected to repeated stress, with a progressive break that starts on a microscopic scale and then grows in time up to lead to the breakage of material when the resistant section no longer bears the stress. It is a catastrophic and sudden breakage which can cause a serious accident. To reduce the risk of accidents, the bicycle needs to be periodically inspected in all its components by an experienced technician; each component must be replaced at the slightest sign of "fatigue", before it gets to the end of its life cycle. To highlight any early phenomena of "fatigue" in their initial stage, penetrant testing is essential.

### 6.2 Brakes

Once a year (or more frequently in case of intense use), the steel cables for mechanical brakes or the specific oil for hydraulic brakes must be changed. Over time, in fact, the steel cables fray and the risk of sudden breakage increases. On the other hand, the hydraulic fluid is highly hygroscopic, and as time passes by, it absorbs the water present in the form of air humidity.

This can cause the formation of vapor bubbles (water transformed into vapor due to the fluid heating by the brake pads) that significantly reduce the oil inherent ability to be incompressible, so the braking force applied to the lever is not completely transmitted to the caliper's pads. Moreover, in the case of front-actuated brakes, in order to ensure a good sliding of the steel cables, it is necessary to treat the inside of the sheaths with low viscosity lubricant and replace them periodically. The replacement of the brake shoes must be carried out before the wear exceeds the limit mentioned on the shoe. The replacement of the disc brake pads must be carried out when the thickness of the pads reaches 1 mm.

### 6.3 Tires

The tires are subjected to two main phenomena of wear:

- the consumption of the tread, due to normal use of the vehicle;
- the hardening of the compound, due to aging of the rubber: in both cases, it is necessary to replace the tires with products having the same characteristics or higher. In case of damage of the air chambers, we recommend the replacement with "anti-drilling" air chambers: in fact, they contain a substance able of closing small holes, reducing the permeability of the rubber and slowing down the normal progressive process of pressure loss.

### 6.4 Rims

If rims are deformed, dented, corroded or show even small cracks as well as other signs of damage or fatigue, they must be replaced immediately. Braking consumes the braking track of the rims (if mechanical circle brakes are available). It is therefore important that your dealer periodically checks the state of rims, in order to replace them in advance when needed.

### 6.5 Wheels and hubs

The wheels should be centered: the axial and radial oscillations of the rim must not be higher than +/- 0.5 mm. The tension of radius must be uniform and properly performed, according to the type of rim (front/rear, with gearbox/single speed, etc.). One of the symptoms of irregular tension is a not-centered wheel. When necessary, the wheel must be re-centred by qualified personnel with specific equipment. In the interface nipple-radius, the specific thread lockers can be used to increase the keeping of the proper tension of the radius. The hub bearings are also subject to wear, and must be inspected, cleaned, lubricated or replaced when needed.

### 6.6 Electrical contacts

The metal electrical contacts are subject to a gradual deterioration over the years, so it is good to treat them regularly with spray products reactivating the conductive power, while verifying the proper mechanical seal.

### 6.7 Motor

The electric motors built into the wheel hub, as well as the engines in the bottom bracket, have a planetary system of gears inside them to optimize the curve of the driving torque output as a function of the revolutions' number of the motor itself. These gears are lubricated at the factory. The electric motor does not need maintenance. No components inside it may wear out in a time equal to that of the vehicle's useful life, if always safely used and maintained.

### 6.8 Chain drive transmission (if available)

The regular cleaning and lubrication of whole chain transmission extends its life ensuring the extremely low noise level. However, chain and gears are subject to wear and must be periodically replaced. There are tools capable of measuring the collapse level of chain, and beyond a certain limit the chain must necessarily be replaced. When changing the chain, it is a good rule to also

replace the gears (front crown/s and rear pinion/cassette). It is also essential to use specific lubricants, also chosen according to the climatic conditions of the area where the bicycle is used.

### **6.9 Belt drive transmission (if available)**

The belt drive transmission system requires no maintenance or replacement. The belt is composed of Kevlar or carbon fibers (based on models) and rubber. The front crown is molded in glass fiber while the rear pinion can be made entirely of metal or molded fiberglass with metal core. If the whole system is professional, the various components do not wear out in a useful life equal to that of the vehicle. On the contrary, if the system is not properly adjusted or has lost the adjustment, the belt could be derailed or it may fray laterally along the longitudinal axis of the bicycle; the breakage of the crowns' flanges (front and/or rear) may occur, or the crowns may deform. It is therefore essential to periodically check the transmission system by expert hands, as well as whenever you have the feeling that something is not working as expected.

### **6.10 Shaft drive transmission (if available)**

The shaft drive transmission requires no maintenance. However, it is advisable to carry out, with the help of a specialized retailer, a periodical inspection of the rear conic torque which transmits the shaft's motion to the wheel.

### **6.11 Suspensions**

The front and rear suspensions (if available) do not require maintenance. However, their correct function and the absence of play must be periodically checked. The suspensions' stems can be cleaned; never lubricate them as the suitable lubricant is already present inside their sheath and is scraped off by the various oil seals during oscillations.

### **6.12 Inspections on the frame**

The frame must be inspected regularly to highlight the possible presence of symptoms of "fatigue" or cracks. Contact your dealer who has the right equipment to detect any problems well in advance.

## **WARRANTY**

### **7.1 Warranty coverage and duration**

FIVE, through its dealer, in Italy, offers the first purchaser of this bicycle a 24-month warranty from the date of retail sale for defects in all electrical or mechanical parts. The warranty is not valid for components subject to wear and/or deterioration, if the defect is caused by normal use or by the wear/deterioration itself. The dealer will proceed to eliminate the defect by repairing or replacing the component, reserving the right to use equivalent parts in the event that the original ones are unavailable. The warranty may vary depending on the country. For all countries other than Italy, and in general for more information, please contact the dealer where you purchased your FIVE bicycles.

### **7.2 Suggested servicing**

Before delivery, a servicing is carried out by the dealer. However, it is strongly recommended to regularly care for the bicycle and have your dealer perform maintenance operations at regular intervals. We recommend that you have your dealer do the first inspection after 100-300 kilometers, 5-15 hours of use or 3-6 weeks. In fact, the "bedding in phase" typically involves safety-relevant bolted connections and spokes slightly losing tension or gears becoming out of adjustment. This bedding and settling in process is unavoidable.

## EN 7.3 Notes on wear and warranty coverage details

Some components on your bicycle are subject to wear due to their function. The rate and intensity of wear depends on the care, maintenance and the way you use your bicycle (mileage, rides in the rain, dirt, salt, additional cargo etc.). Bicycles that are often or always outdoors can wear out more quickly due to weather conditions. Regular care and maintenance will increase the lifespan. However, the components listed below should be replaced when they reach the wear and/or deterioration limit.

- Battery
- Drive chain
- Brake pads
- Brake fluid
- Brake discs / rotors
- Brake cables
- Brake cable housing
- Seals of suspension elements
- Rim (of rim brakes)
- Rubber grips
- Cables / connectors
- Chainrings
- Illuminants
- Tyres
- Sprockets
- Saddle covering
- Bowden cables
- Bowden cable housing
- Pulleys
- Lubricants

The warranty does not cover:

- anything other than a defect in the product;
- abuse, improper or negligent use, accidents;
- products from which the identification codes have been removed or altered;
- damage caused by incorrect assembly, tampering, modifications;
- damage resulting from improper, irregular or otherwise unauthorized technical interventions;
- corrosion damage caused by use on salt-covered roads or in locations close to the sea;
- damage caused by water when the user has exposed the component or bicycle beyond the level permitted for that component or bicycle;
- aesthetic damage that was evident or easily detectable at the time of purchase;
- damage caused by use together with incompatible components;
- damage to the battery caused by external factors such as overloads, high temperatures, complete discharges, short circuits, charging with incompatible battery chargers, impacts;
- damage during transport, for which the forwarder is liable;
- products used commercially, in bike sharing, rented or on free loan and professional use in general;
- normal wear and tear and/or deterioration in all its forms, including for example the progressive loss of battery capacity and material fatigue;
- normal periodic maintenance;
- the costs of taking the bicycle to the dealer for repair and of collecting it after the repair.

## 7.4 Procedure

In the event of a suspected defect, you must request an inspection from your dealer to evaluate the cause and origin of the problem. The bicycle must be brought to the dealer in its entirety, together with purchase invoice/receipt and warranty documents proving the sale and the performance of the prescribed services. If a defect is actually found, the dealer will proceed to eliminate the defect without any charges for you. If the problem does not depend on a defect or is not covered by the warranty, the dealer will propose a paid repair.



## 8 ASSEMBLY AND INSPECTION PRIOR TO DELIVERY

FIVE provides the retailer a bicycle in a packaging where it is partially assembled. The retailer must complete the assembly and carry out all checks about functionality and safety listed here, to deliver a bicycle in perfect conditions of use.

- The handlebar is installed, well adjusted and fixed.
- The pedals are securely tightened in the pedal cranks.
- The saddle is well adjusted and fixed.
- Mounting and locking the wheels to the frame.
- The wheels are centered.
- The transmission works properly.
- The pedal cranks are well fixed to the bottom bracket.
- The tires were inflated to the correct pressure.
- The lights have been checked.
- The handlebar set is smooth and has no play.
- The gearbox works properly (if available).
- Fenders, carter and battery are well fixed.
- The brakes are working properly.
- The height of the stand is correct.
- The electrical system and the battery are working properly.
- Successful riding test.

## 9 PERIODICAL MAINTENANCE

Minimal maintenance suggested for servicing, to be carried out at least once a year or, if needed, more frequently in accordance with the operating conditions of the bicycle:

- check there are no signs of material fatigue on whole bike;
- check that the corrosion has not compromised the structural integrity;
- get the tires to the correct pressure;
- check the radius and replace them if needed;
- check the wear on the tires and replace them if necessary;
- check the wear of the rims and replace them if necessary;
- check if the wheels are properly fixed to the frame;
- check the centering of the wheels and restore it if necessary;
- check the brake shoes or pads and replace or adjust them if necessary;
- replace and adjust the cables of the mechanical brakes, or replace the oil of the hydraulic brakes;
- check the brake sheaths or tubes, lubricate and replace if necessary;
- check the tightness of all the brakes' screws;
- check the handlebar set and adjust it if necessary;
- check the fastening of the handlebar and the brake lever;
- check the fastening of the pedals on the pedal cranks;
- clean the inside of the pedal sensor;
- check the correct mounting of the pedal cranks to the bottom bracket;
- check the play and smoothness of the bottom bracket and replace it if necessary;
- check the height of the stand;
- check the operation of both lights, and replace the batteries when necessary (if available);
- clean and lubricate the driving elements and eventually replace the worn components;
- check the tension of the chain;

- check the gearbox, lubricate and adjust if necessary;
- check the correct fixing of the saddle to the seat tube;
- check the correct fixing of the seat tube to the frame;
- check the correct fixing of the rack to the frame (if available);
- clean the power contacts battery side and frame side;
- apply the spray for cleaning contacts on all electrical wiring;
- with the aid of a tester, check that the battery is approximately 42V at full charge if the battery is 36V, or 54V at full charge if the battery is 48V;
- check the integrity of the cables and the charger connector;
- try the bike on the road with and without electric assistance.

## 10 INSTRUCTIONS UPDATE



The instructions indicated in this manual are constantly updated.

Consult the most updated version on the websites: [www.italwin.it/download](http://www.italwin.it/download) and [www.wayel.it/download](http://www.wayel.it/download).

## Owner personal data

Name	Surname	Date of birth
<hr/>		
Address	City	Phone no..
<hr/>		
E-mail address	Date of purchase	Invoice/receipt no.
<hr/>		
Bike model	Series no. of frame	Series no. of battery.
<hr/>		
Retailer name		
<hr/>		

Buyer's signature

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Stamp and signature of retailer

## CERTIFICATE OF DELIVERY

The retailer declares to have carried out all the checks pre-delivery of the bicycle .....series no. ....  
 ..... and that the bike is now being delivered to the above mentioned Customer, declaring to receive it  
 in perfect condition, ready to use and equipped with a User Manual and Warranty Booklet.

Date

The Dealer  
 The Customer

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**FIVE**

**Fabbrica Italiana Veicoli Elettrici**

**FIVE srl**

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