USER MANUAL

OFF-R

Follow us

Vmoto

www.vmoto.com

HAPPINESS IS A JOURNEY

FOREWORD

WELCOME TO VMOTO ELECTRIC VEHICLE WORLD.

Dear VMOTO OFF-R electric vehicle users :

We will guide you to understand and get familiar with the functions of the OFF-R electric vehicle, and how to use and maintain it in a correct and safe way.

To ensure your safety, we recommend you to be familiar with and understand the OFF-R electric vehicle so that you can drive it safely and reliably under various road conditions. Please read the manual carefully before driving, and always comply with the following requirements: the manual will provide you with a comprehensive overview of the basic features of the OFF-R electric vehicle, important information about the vehicle's equipment, and important recommendations and warnings that you should follow. It also contains information you need to know about vehicle maintenance, maintenance methods and preventive measures for operation. If you have any operation and maintenance problems not included in the manual,

FOREWORD

please contact your local VMOTO authorized distributor. We are always at your service. Wish you a happy riding travel with your OFF-R electric vehicle.

The manual contains important information, precautions, warnings and hazard tips of OFF-R about vehicle use. The figures in the manual may be slightly different from this vehicle in details, but the principles depicted are the same.

Note: VMOTO OFF-R electric vehicle has maintained a continuous and intensive development of structure, equipment and accessories, ensuring that the vehicle products constantly comply with new safety and quality standards. Therefore, there are differences between the contents of the manual and your vehicle. VMOTO reserves the right to correct errors. Accordingly, none of these data, figures or descriptions can be used as a basis for any claims.

FOREWORD

Warning:

❶ For safety reasons, please always wear protective equipment that complies with laws and regulations, is intact and suitable, such as helmets, boots, gloves, pants and jackets with protective functions;

❷ When using in the road traffic, should hold the corresponding driving license, and comply with the local laws and regulations;

❸ A person who is unfit to drive due to physical or psychological reasons shall not drive a vehicle. Persons who have drunk alcohol, taken drugs or taken medicine shall not drive vehicles;

❹ Minors under the age of 16 are not allowed to drive this electric vehicle.

Note:

This product is a high-performance electric vehicle. Please pay attention to the following items when driving:

❶ Users are not allowed to modify this vehicle;

❷ Any modification to the equipment of this product will affect the performance of the vehicle.

VIN CODE OF THE VEHICLE

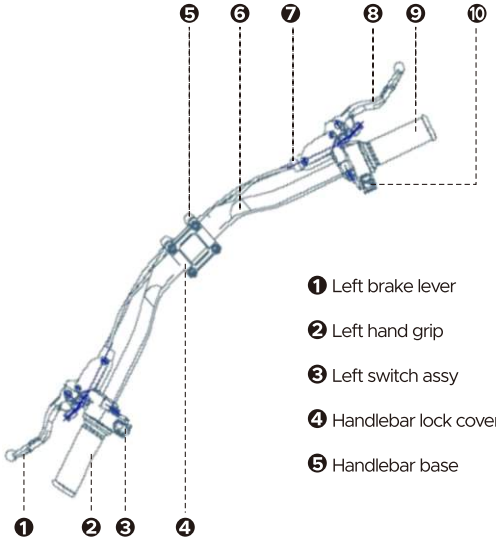


❶ Manufacturer's statutory plate

❷ Vehicle identification number (VIN)

❸ Motor model and manufacturing code

LEFT AND RIGHT BRAKE LEVER SWITCHES



❶ Left brake lever

❷ Left hand grip

❸ Left switch assy

❹ Handlebar lock cover

❺ Handlebar base

❻ Handle bar

❼ Brake switch

❽ Right brake lever

❾ Right throttle grip

❿ Right speed control switch

COMBINATION SWITCH OF LEFT BRAKE LEVER



❶ High and low beam switch

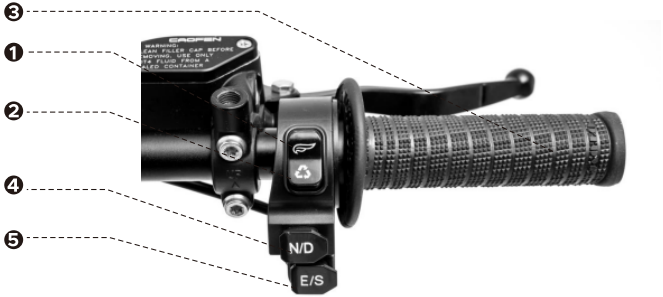
Press left to open far beam.

Press right to open near beam.

❷ Horn switch

Press the switch and the horn will sound.

COMBINATION SWITCH OF RIGHT BRAKE LEVER



❶ Infotainment mode switch

Press upward for 3 seconds to turn this mode on and off.

❷ Energy recovery indicator

Constantly on: Stage braking means energy recovery.

Flashing: Stage release acceleration switch has energy recovery.

Extinguish: Energy recovery is turned off.

COMBINATION SWITCH OF RIGHT BRAKE LEVER

❸ Right throttle grip

- Turn the grip backward to accelerate

❹ Gear and neutral shift button

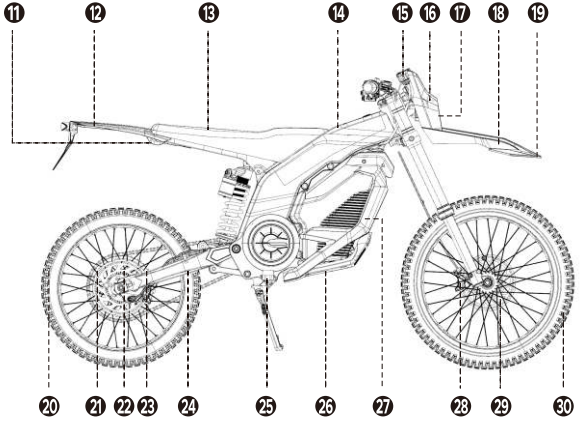
N/D Instrument movement D gear lights on and off (default N gear every time you start)

- If steady on, the gear D is applied and the vehicle can be driven;
- If lighting off, the neutral gear is applied (not displayed) and the vehicle cannot be driven.

❺ Gear shift button

E/S Power gear display: the button circulates in gears 1, 2 and 3; when the indicator is steady on, gear 1 applied; when flashing slowly, gear 2 applied; when flashing fast, gear 3 applied. The gear number is also displayed in the current gear area of the meter.

LEFT SIDE



LEFT SIDE

⓫ Rear fender bracket for off-road vehicle

⓬ Off-road rear fender

⓭ Seat

⓮ Frame

⓯ Speedometer assy

⓰ Head light cover

⓱ Horn head light assy

⓲ Front fender A

⓳ Front fender B

⓴ Rear outer tyre

㉑ Rear brake disc

㉒ Rear brake fixing bracket

㉓ Rear hydraulic brake

㉔ Rear fork assembly

㉕ Front right pedal assembly

㉖ Battery protection panel

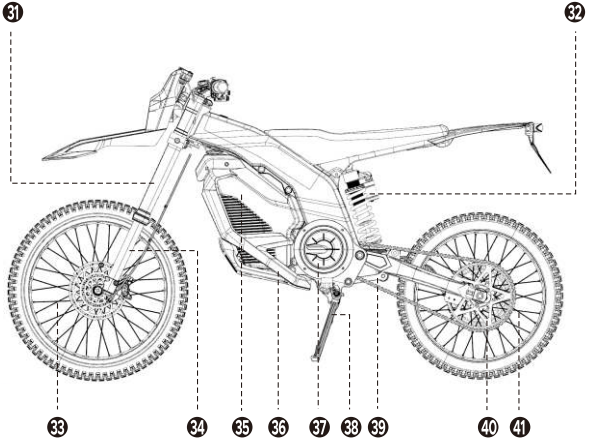
㉗ Battery right guard plate

㉘ Front hydraulic brake

㉙ Front brake disc

㉚ Front outer tyre

RIGHT SIDE



㉛ Front shock absorber

㉜ Rear shock absorber assy.

㉝ Front rim assembly

㉞ Front fork decorative cover

㉟ Lithium battery pack

㊱ Battery left guard plate

㊲ Side cover

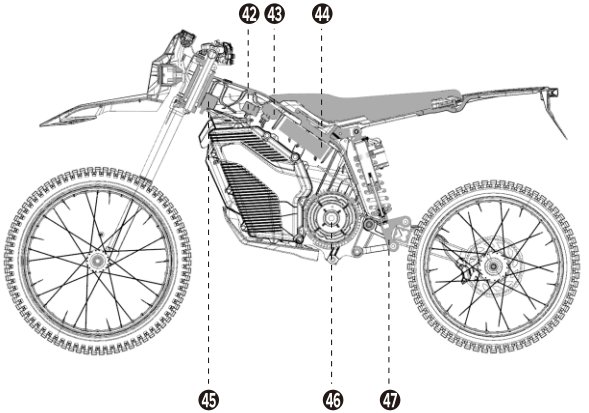
㊳ Side stand

㊴ Rocker connecting arm

㊵ Rear sprocket

㊶ Rear rim assembly

FRAME INTERIOR



42 DC-DC converter

43 One-click start

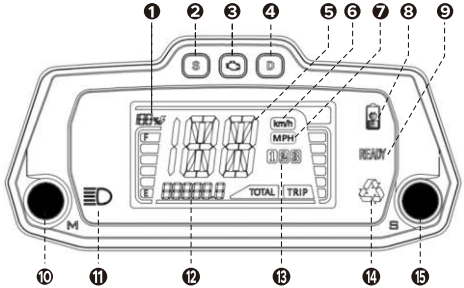
44 Controller

45 Handlebar lock

46 Motor

47 Triangle cradle

METER ASSEMBLY



❶ SOC display
❷ Power gear display
❸ Fault display
❹ Drive gear display
❺ Speed display
❻ Speed unit (km)
❼ Speed unit (mile)
❽ Charging warning light
❾ Driving lamp
❿ Function switch button
⓫ High beam indicator
⓬ Total ODO display/fault code display
⓭ Current drive gear
⓮ Energy recovery
⓯ Function switch button

Tip: The meter of your electric vehicle may be slightly different from the description in the manual, but the function is the same.

METER DISPLAY INSTRUCTION

● Please use the legitimate remote control of the vehicle to control unlocking and power on, and the instrument LCD screen will light up.
 High beam: The meter is initially set into the daily running light, press the light button on the left switch assembly of the left brake lever, and the high beam will be turned on.
 Entertainment mode display: When it is on, there is no traction control (that is, no brake is powered off), and when it is off, there is traction control (that is, the brake is powered off).
 Sport gear: When the S indicator flashes, gear D is applied; when it is steady on, gear 1 applied; when flashing slowly, gear 2 applied; when flashing fast, gear 3 applied.
 Sport gear: When the S indicator flashes, gear D is applied; when it is steady on, gear 1 applied; when flashing slowly, gear 2 applied; when flashing fast, gear 3 applied.
READY Indicator: It is controlled by the steering lock key or the start button (depending on the power-on switch of the vehicle); 1. If it is steady on, the vehicle will be started; 2. If it is turned off, the vehicle will not be started.

METER DISPLAY INSTRUCTION

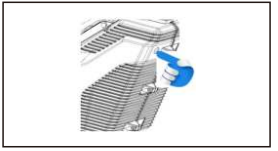
	Energy recovery indicator: 1. Steady on: the auxiliary brake is applied to recover the energy after a delay of 20 ms when the braking signal is detected (or the speed is reduced by 10%); 2. Flashing: the energy is recovered after the throttle is released; 3. Off: the energy recovery is disabled.
	Charging warning light: 1. Off: sufficient power; 2. Steady on: warning for insufficient power; 3. Flashing: the battery is in low voltage and should be charged as soon as possible.
	Function switch button - M button: 1. Press it once: switch the display of trip and total; the trip and maximum speed are displayed at the same time; the speedometer shows the current speed when the vehicle is running; 2. Press and hold it: switch the mileage unit between km and mile.
	Function switch button - M button: button: In trip mode, press and hold the S button for more than 2 seconds, and the trip and max. Speed will be cleared zero synchronously.

Tip: The meter of your electric vehicle may be slightly different from the description in the manual, but the function is the same.

QUICK START OF VEHICLE



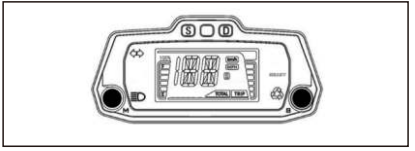
❶ Proper helmet wearing



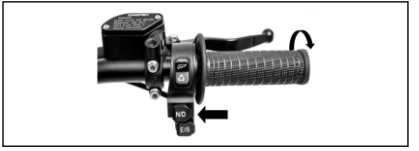
❷ Press the battery switch



❸ Press the remote control button to unlock and power on.



❹ After the remote control is pressed,the READY light on the instrument will light up.

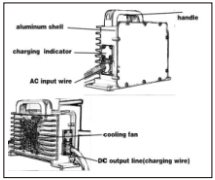


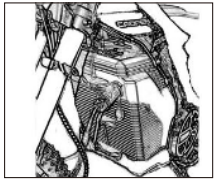
❺ Press the upper N/D key of the right turn lever.switch to drive D gear, gently rotate the switch grip, and you can drive normally.

Tip: When the temperature is lower than 0℃ , the low-temperature protection of the battery system may be triggered. In this case, recharge the battery first; otherwise, the vehicle may not run normally. When "E" fault code appears on the meter, please refer to the manual to check the fault code displayed, and contact the local distributor as soon as possible.

CHARGING PROCEDURE

- Check the charger and ensure that it is the original one matched with the battery.
- Turn on the battery power switch.
- Connect the charger output plug with the battery charging port (check whether it is plugged in place).
- Connect the charger mains input to the socket (input voltage : AC110V-AC220V).
- After 3-5 seconds, the charger indicator flashes, the fan rotates and the charger start charging; after the battery is fully charged, the indicator turns green and flashes.
- After fully charged, cut off the commercial power supply, and then remove the power plug.



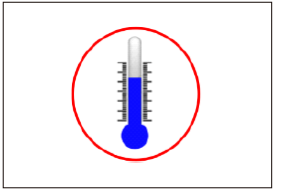


Warning: It is strictly forbidden to use AC220V power supply for AC110V(100V) special charger! Otherwise, there may be serious safety hazards.

CHARGING PROCEDURE

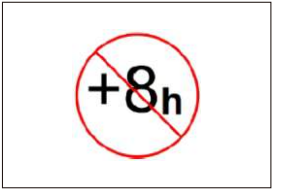


● Please charge the battery with the original charger rather than other brands of chargers.



● Please charge the ternary lithium battery at -40℃ to 50℃.

● Please charge the lithium iron phosphate battery at -10℃ to 45℃.



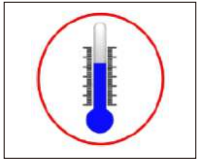
● Do not charge the battery for more than 8 hours, because ultra-long charging will affect the service life of the battery.

◆ It is unnecessary to fully charge the battery each time, but recharge it fully with a special charger every once in a while (the charger stops automatically, its indicator lights green for a long time, and the SOC shown on the meter is 100%), making the whole battery system in good condition.

CHARGING PROCEDURE

- The charging speed is fast in early stage while slowly in later stage, which is set for safe charging.
- In winter, if the temperature is below 0℃ , the charging time is longer than that at ideal temperature, which is a normal phenomenon. Please charge the battery at proper ambient temperature to ensure the charging effect.
- During charging, if the indicator is abnormal, the charger has peculiar smell or the charger shell is overheated, please immediately stop charging and replace the charger. Do not disassemble or replace the internal components of the charger. When replacing the charger, the new charger should be made by the original manufacturer.

OPERATING ENVIRONMENT



● Use the ternary lithium battery between -40℃ and 50℃.

● Use lithium iron phosphate battery between -10℃ and 45℃.



● Protect the battery from being soaked by water, beverages and corrosive liquids.

● Do not wash the interior and meter of the vehicle with water cannon.



● Keep your vehicle or battery away from open flame, heat source, and flammable and explosive gas or liquid.



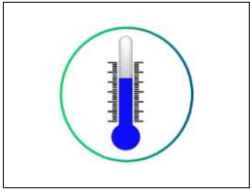
● Keep the metal or other conductive objects from entering the battery case.

● Do not short-circuit the anode and cathode of the battery with wire or other metal object.

◆ At low temperatures, the available capacity of the battery will be decreased to different degrees, which will shorten the riding mileage. As long as it is not abnormally decreased significantly, it is normal. If you have questions, please contact the local distributor or after-sales service center of VMOTO.

◆ If the battery is abnormal in heating, scorched smell, smoking or special sour liquid leakage, stop using it immediately and contact the local after-sales service center or our company in time!

STORAGE ENVIRONMENT



● At ordinary times, the vehicle or battery should be stored in a dry and ventilated place with an indoor temperature of not over 45℃(not over 60℃ for liquid-cooled battery).

● For long-term storage, it should be stored at 0℃ to 30℃. If stored at an environment higher than 45℃ (60℃ for liquid-cooled battery), the battery capacity will be irreversibly attenuated.



● Before long-term storage, it should be confirmed that the battery capacity is between 50% and 80%. If it is insufficient, please recharge the battery. After charged to the recommended capacity, turn off the switch of the battery system, and then put it aside for storage.

● When the vehicle is stored for a long time, due to the self-consumption of the battery, the meter shows a decrease in power after a period of storage, which is normal.



● The battery of new vehicle should be charged for 0.5-1 hour within 30 days due to the factors of transport, production cycle and battery self-consumption.

● Long-term storage, please keep the power between 50%-70%, check and replenish the power every 3 months (charging 2h).

STORAGE ENVIRONMENT

- Prior to storage, check the function and wear of the vehicle and turn off the power switch.
- Keep the vehicle from exposure to sunlight and rain to reduce damage or aging of components.
- The battery should be fully charged if the vehicle is used against after long-term storage.


Do not store the battery with acidic and other corrosive substances and flammable and explosive materials.

PRECAUTIONS FOR BATTERY USE

- When the battery is used for the first time, please discharge it as much as possible, and then fully it before use, so as to ensure the actual capacity of the battery as accurate as the SOC displayed on the meter or activate the battery management software.

- In the daily use of the vehicle, when the SOC is insufficient, the battery should be charged in time and frequently to extend the service life of the battery.

- There may be a deviation between the actual capacity of the battery and the SOC displayed on the meter during the long-term use of the vehicle. Please charge and discharge the battery regularly (no more than 3 months). The built-in battery cell and intelligent system can automatically calibrate the SOC of the battery to improve the experience.



It is strictly prohibited to reverse the positive and negative electrodes; Do not put the battery pack into the water, and do not short-circuit the positive and negative electrodes of the battery with wires or other metal objects; When cleaning the vehicle, it is strictly prohibited to wash the positive and negative battery socket and charging ports directly with water.

PRECAUTIONS FOR BATTERY USE

⚠ It is forbidden to throw, squeeze, impact or puncture the battery, or expose it to sunlight for a long time, or use it in high-temperature environment (above 60 ℃). Otherwise, the battery will not be used due to overheat protection, or will be heated, smoked, caught fire or exploded during use. Frequent use of battery in high temperature environment will affect battery performance, shorten battery service life and reduce battery safety.

⚠ Please charge the battery with the supporting special charger. As self-equipped charger will result in product damage and safety problems, customers should fully realize its harmfulness and take full responsibility!

⚠ If the vehicle is involved in water, the water level must not exceed the height of the tire (water depth of about 60cm), otherwise the surge may cause water to enter the controller connector, resulting in short circuit, which will cause vehicle damage. In this case, it is prohibited to recharge the entire vehicle or the battery, otherwise accessories damage, battery fire, combustion and explosion may occur. The correct treatment is: please immediately transfer the vehicle to the dealer for after-sales inspection.

PRECAUTIONS FOR BATTERY USE

⚠ The battery can not be repaired by the user. If it is abnormal, please contact the distributor. Unprofessional disassembly may cause the battery to be heated, smoked, caught on fire or exploded. If the user opens the battery case without permission, the battery damage can not be suitable for the warranty agreement.

⚠ Our ternary lithium battery packs add the industry's unique fully submersible liquid cooling thermal management solution: and the battery modules are fully submersible in a compound, environmentally friendly liquid cooling solvent; The high specific heat capacity solvent can help achieve rapid heat dissipation and heat balance of the battery, the typical temperature difference does not exceed 2 ℃, maintain the consistency of the battery temperature, and effectively extend the battery life; The compound environmental protection liquid cooling solvent has non-toxic, tasteless, flame retardant and insulation.

⚠ If the liquid in the battery enters the eyes, do not rub it with hands, but wash it with clean water immediately and seek medical help in time. If left untreated, eyes may be damaged.

PRECAUTIONS FOR BATTERY USE



Warning

The operating voltage of the vehicle exceeds 60V, please turn off the power supply during maintenance. Improper maintenance may cause electric shock and burn components, resulting in personal injury or vehicle damage.



Warning

In case long time no use battery, please charge it till 50%. Disconnect the battery from bike when storing them. Store in dry ventilated place, at least charge 2 hours each 3 months. Otherwise, the battery damage can not be suitable for the warranty agreement.

DAILY MAINTENANCE AND REGULAR MAINTENANCE SERVICE TIPS

- Routine check before driving -

Item	Procedures	Warning prompt
Right throttle grip	● Make sure that the throttle grip operates stably and rotates flexibly.	⚠ **Potential hazard** ❶ Without inspection and maintenance before operation, it is more prone to cause incidents or mechanical damage. ❷ The worn brake shoe will reduce the braking effect.
State of charge (SOC)	● Check the SOC and whether it needs to be charged.	
Front and rear brake	● No brake fluid is leaking and the brakes are applied normally. Brake discs and brake shoes are free from water and oil stains.	
Brake lever	● Make sure it can be operated normally.	

- Routine check before driving -

Item	Procedures	Warning prompt
Tires	● Ensure that the tire pressure is correct and adjust it if necessary. The recommended tire pressure is 225Kpa for front and rear wheels ● Check whether the surface is worn, cracked, adhered with foreign matters or perforated.	❸ The brake discs will be worn, thinned, cracked or deformed after frequently used, which may lead to brake failure.
Drive chain	● Check the chain for looseness and lubrication, and adjust it if necessary.	❹ There may be abnormal sound or frequent chain detaching if the tensioner and chain guide are damaged and broken.
Tensioning wheel	● After pressed, it can rebound normally, and the rubber wheel is free from damage and fracture.	

- Routine check before driving -

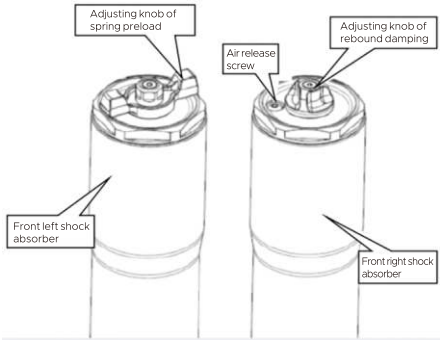
Item	Procedures	Warning prompt
Chain guide	● There is no foreign matters stuck in the chain groove, and the accessories are free of fracture, crack, deformation and rubbing with chain.	
Instrument	● After power-on, check whether there is a fault code, whether the READY indicator lights up after the side stand is retracted, and whether the display is normal.	⚠ Notes ● Improper spoke tightness will seriously affect driving safety, so it shall be checked regularly.
Left and right brake levers	● After the vehicle is powered on, confirm that the buttons works normally before riding.	
Steering system	● The handlebar is rotated flexibly without sticking. The steering stem is free of runout or looseness.	

- Routine check before driving -

Item	Procedures	Warning prompt
Shock absorber	● After pressed, it can return smoothly.	⚠ How to avoid ❶ Make sure that your vehicle is in a safe state before each operation. ❷ Follow the procedures and operations described in the Manual.
Light	● High beam, daytime running lamp, tail lamp, brake lamp, turn signal and license plate lamp can light up normally.	
Horn	● It works normally.	
Rear-view mirror	● Clean and adjust to proper rear view angle,	
Rim assembly	● Check the tightness of the spokes, and adjust them if they are loosened.	

- Shock absorber - Front absorber adjustment -

The preload of the shock absorber is adjusted to adapt to different drivers, loads, driving modes and road conditions to make the vehicle to achieve the best driving performance and avoid damage to the front fork, rear shock absorber and body.



External adjustment function of front shock absorber:

A.Rebound damping adjustment;

B.Spring preload adjustment.

- Shock absorber - Front absorber adjustment -

◆ **Rebound damping adjustment**

As shown in the figure, the rebound damping can be adjusted by manually rotating the red adjusting knob of rebound damping at the top of the right front shock absorber.

❶ Rotate the knob clockwise to increase the rebound damping and make the front shock absorber slow down during rebound; rotate it counterclockwise to reduce the rebound damping and make the front shock absorber become faster during rebound.

❷ The rebound damping can be adjusted by 12 segments and can be set appropriately according to the rider's weight, habits and road conditions. It is generally adjusted clockwise to the maximum and then counterclockwise to the required segment. When adjusting, the force applied should be moderate, and the adjustment stopped immediately in case of slight resistance, so as not to exceed the bearing limit of the adjusting screw.

- Shock absorber - Front absorber adjustment -

❸ When driving on a mountain road or a curved road, rotate the rebound damping adjusting knob clockwise to slow down the rebound and reduce the vehicle shaking; When driving in urban areas or on bad roads, the adjusting knob of rebound damping can be rotated counterclockwise to make the shock absorber rebound faster and less hard;

❹ Strenuous driving for a long time will increase the air pressure inside the right tube, making the shock absorber become hard, then unscrew the air release screws on the left and right tubes with a straight screwdriver, and lock them after the air is released.

◆ Spring preload adjustment

❶ The support force of shock absorber can be adjusted by manually rotating the blue adjusting knob of spring preload at the top of the left front shock absorber.

- Shock absorber - Front absorber adjustment -

❷ Rotate the knob clockwise to increase the support force; rotate it counterclockwise rotation to reduce the support force

❸ The adjustable height of spring preload is 12.5mm, and the spring adjusting knob is rotated by one turn to lift up the preload by 1.25mm;

❹ When adjusting, the force applied should be moderate, and the adjustment stopped immediately in case of slight resistance, so as not to exceed the bearing limit of the adjusting screw.

❺ The spring weight is 48LBS, and the spring preload of 12.5mm can increase the supporting force by 8.5KG.

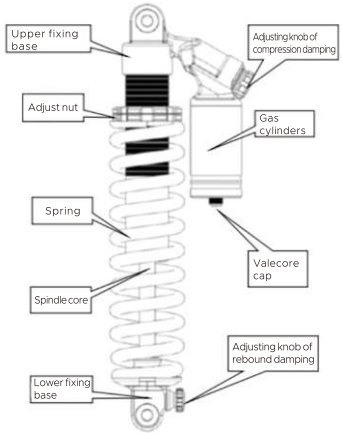
- Shock absorber - Rear shock absorber adjustment -

External adjustment of rear shock absorber:

A. Rebound damping adjustment;

B. Compression damping adjustment;

C. Spring preload adjustment.



◆ **Rebound damping adjustment**

Here the rebound damping can be adjusted by rotating the red adjusting knob of rebound damping on the lower fixing base of rear shock absorber.

- Shock absorber - Rear shock absorber adjustment -

❶ Rotate the knob clockwise to increase the rebound damping and make the rear shock absorber slow down during rebound; Rotate it counterclockwise to reduce the rebound damping and make the rear shock absorber become faster during rebound.

❷ The rebound damping can be adjusted by 12 segments and can be set appropriately according to the rider's weight, habits and road conditions. It is generally adjusted clockwise to the maximum and then counterclockwise to the required segment. When adjusting, the force applied should be moderate, and the adjustment stopped immediately in case of slight resistance, so as not to exceed the bearing limit of the adjusting screw.

❸ When driving on a mountain road or a curved road, rotate the adjusting knob of rebound damping clockwise to slow down the rebound and reduce the vehicle shaking;

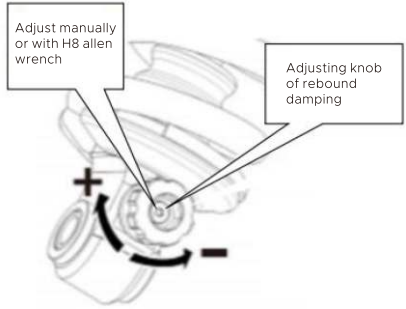
❹ When driving in urban areas or on bad roads, the adjusting knob of rebound damping can be rotated counterclockwise to make the shock absorber rebound faster and less hard;

- Shock absorber - Rear shock absorber adjustment -

◆ **Compression damping adjustment**

❶ The compression damping can be adjusted by rotating the blue adjusting knob of compression damping on the upper fixing base of rear shock absorber.

❷ Rotate the knob clockwise to increase the compression damping and make the front shock absorber hard when pressed down; Rotate it counterclockwise to reduce the compression damping and make the front reducer soft when pressed down.



- Shock absorber - Rear shock absorber adjustment -

◆ **Compression damping adjustment**

❸ The compression damping can be adjusted by 18 segments. It is generally adjusted clockwise to the maximum and then counterclockwise to the required segment. When adjusting, the force applied should be moderate, and the adjustment stopped immediately in case of slight resistance, so as not to exceed the bearing limit of the adjusting screw.

❹ Compression damping can be set according to the rider's weight, habits and road conditions.

❺ When driving on the flat road, adjust the compression adjusting screw clockwise to increase the damping, and increase driving stability;

❻ When the load is increased, the compression damping can be appropriately increased so as not to bottom out the shock absorber;

- Shock absorber - Rear shock absorber adjustment -

❼ When the body sinks too fast or shakes excessively when making a turn, the compression damping can be appropriately increased;

❽ When driving on bad roads, the compression adjusting screw should be adjusted counterclockwise to decrease the damping and improve the driving comfort;

❾ When the shock absorber sinks slowly, or the shock absorber become hard and the body jumps when passing through poor roads, the compression damping can be reduced appropriately.

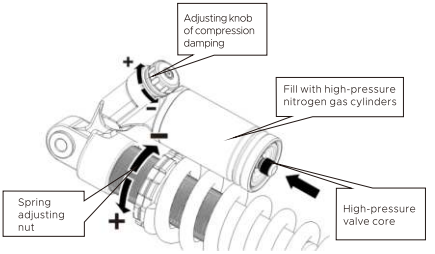
- Shock absorber - Rear shock absorber adjustment -

◆ **Spring preload adjustment**

As shown in figure , the customized special claw wrench can rotate the spring adjusting nut forward and backward to change the preload height of the spring and thus adjust the support force of rear shock absorber.

❶ Rotate the spring adjusting nut clockwise to increase the support force of rear shock absorber or counterclockwise to reduce the support force.

❷ The rear shock absorber spring of,VMOTO OFF-R is 550-800LBS in weight, the total length of the spring is 180mm, and the height of the preload can be adjusted to 0-10mm.



Tip: Special tool is required for preload adjustment of the rear shock absorber spring. Please turn to your local VMOTO distributor if possible.

- Trouble shooting -

Fault Phenomenon	Fault Causes	Solutions
The battery switch cannot be pressed down because it is turned off by bounce-back immediately after it is turned on.	1. There may be silt inside the switch; 2. The battery management software is unmatched and the battery is turned off for self-protection.	1. Wash the switch gently with clear water until it can be pressed smoothly; 2. Refresh the correct battery management software.
After the battery is turned on, the vehicle is not powered on.	1. The power switch is not turned on; 2.The remote control of steering lock is out of its control range; 3. The remote control panel is damaged; 4.The steering lock controller is damaged; 5. 72V fuse is burned out; 6. The steering lock is faulty.	1. Turn on the battery power switch again; 2. Replace the steering lock controller; 3. Replace 7.5A fuse on 72V output circuit; 4. Check whether the steering lock connector is loose or reversed, and replace the steering lock.

- Trouble shooting -

Fault Phenomenon	Fault Causes	Solutions
Turn on the battery switch, rotate the throttle grip, but the meter is not started (no fault code is shown on the meter)	1. It is not started according to correct startup procedure; 2. The vehicle is in braking state; 3. The right throttle grip is faulty or damaged.	1. Restart according to correct startup procedure; 2. If the brake indicator is steady on, the brake switch and brake lever may press the brake switch contact, and it is necessary to screw outward the brake switch properly until the brake indicator lights off; 3. Rotate the grip in the opposite direction to zero and check whether it is normal to restore the throttle pedal; replace the right throttle grip if there is no response after stepping the throttle pedal.

- Trouble shooting -

Fault Phenomenon	Fault Causes	Solutions
The travel distance is insufficient.	1. The battery is not fully charged; 2. The tire pressure is insufficient; 3. The vehicle is braked and started frequently; 4. The vehicle is overloaded; 5. The battery is attenuated normally; 6. The ambient temperature is too low and the battery discharge capacity decreases.	1. Check whether the charger is properly used or damaged; 2. Check whether the tire pressure is appropriate for the road conditions on the day; 3. Develop good riding habits; 4. Items 5 and 6 are normal phenomena; battery attenuation is caused by insufficient driving; you can buy a new battery from the VMOTO distributor.

- Trouble shooting -

Fault Phenomenon	Fault Causes	Solutions
The battery cannot be charged.	1. The battery switch is not turned on. 2. The plug is not inserted correctly. 3. The battery temperature is too low. 4. The battery temperature is too high.	1. Check and turn on the battery switch. 2. Check whether the plug and the external power socket are normal, and re-plug. 3. Recharge the battery after the battery temperature reaches the normal charging temperature. 4. Contact VMOTO distributor or after-sales personnel to check the battery condition.

DAILY MAINTENANCE AND REGULAR MAINTENANCE SERVICE TIPS

- Maintenance items and intervals -

Maintenance items	Mileage/interval (whichever comes first)						
	600mi/ 1000km or 3 months	3000mi/ 4800km or 6 months	6000mi/ 9600km or 12month	9000mi/ 14500km or 18 month	12000mi/ 19300km or 24 months	15000mi/ 24000km or 30 months	18000mi/ 29000km or 36 months
Right throttle grip Make sure that the throttle grip is stable in operation and flexible in rotation, and can spring back to the starting point after rotated to the end and released; The voltage is 0.84 V at startup and maximally up to 3.95V.	√	√	√	√	√	√	√
Battery pack Check the battery for abnormal heating, scorched smell, smoke or special sour liquid leakage, visible damage and collision marks.	√	√	√	√	√	√	√

- Maintenance items and intervals -

Maintenance items	Mileage/interval (whichever comes first)						
	600mi/ 1000km or 3 months	3000mi/ 4800km or 6 months	6000mi/ 9600km or 12month	9000mi/ 14500km or 18 month	12000mi/ 19300km or 24 months	15000mi/ 24000km or 30 months	18000mi/ 29000km or 36 months
Front brake							
Check whether the operating fulcrum of brake lever is normal, fluid level in the pump, oil leakage, brake shoe replacement, and brake disc wear and deformation.	For safety, it is recommended to replace the brake shoe no matter whether it is worn beyond the limit.						
Rear brake							
Check whether the operating fulcrum of brake lever is normal, fluid level in the pump, oil leakage, brake shoe replacement, and brake disc wear and deformation.	For safety, it is recommended to replace the brake shoe no matter whether it is worn beyond the limit.						

- Maintenance items and intervals -

Maintenance items	Mileage/interval (whichever comes first)						
	600mi/ 1000km or 3 months	3000mi/ 4800km or 6 months	6000mi/ 9600km or 12month	9000mi/ 14500km or 18 month	12000mi/ 19300km or 24 months	15000mi/ 24000km or 30 months	18000mi/ 29000km or 36 months
Front and rear brake switches Check the operation and correct if necessary.	√	√	√	√	√	√	√
Steering system The steering bar is rotated flexibly within the steering range. The upper and lower steering bearings shall not have obvious clearance.	√	√	√	√	√	√	√
Light Observe that all lights are turned on normally, and replace them if necessary.	√	√	√	√	√	√	√

- Maintenance items and intervals -

Maintenance items	Mileage/interval (whichever comes first)						
	600mi/ 1000km or 3 months	3000mi/ 4800km or 6 months	6000mi/ 9600km or 12month	9000mi/ 14500km or 18 month	12000mi/ 19300km or 24 months	15000mi/ 24000km or 30 months	18000mi/ 29000km or 36 months
Shock absorber It should operate and retract smoothly. Check for oil leakage It should be adjusted or operated normally; if not, repair or replace it.	√	√	√	√	√	√	√
Rim assembly Check whether the bearing is loose or damaged, and replace it if necessary. Check the spoke for looseness, slipping and cap removal, and adjust or replace it if necessary.	√	√	√	√	√	√	√

DAILY MAINTENANCE AND REGULAR MAINTENANCE SERVICE TIPS

- Maintenance items and intervals -

Maintenance items	Mileage/interval (whichever comes first)						
	600mi/ 1000km or 3 months	3000mi/ 4800km or 6 months	6000mi/ 9600km or 12month	9000mi/ 14500km or 18 month	12000mi/ 19300km or 24 months	15000mi/ 24000km or 30 months	18000mi/ 29000km or 36 months
Tires							
Check tire wear and bead toe and replace them if necessary. Check whether the tire pressure is correct, and adjust it if necessary. Check the aging of tires and replace them if necessary.	√	√	√	√	√	√	√
Motor							
Check whether the casing and cable are cracked or damaged. Check whether it runs normally without abnormal sound and abnormal temperature rise.	√	√	√	√	√	√	√

- Maintenance items and intervals -

Maintenance items	Mileage/interval (whichever comes first)						
	600mi/ 1000km or 3 months	3000mi/ 4800km or 6 months	6000mi/ 9600km or 12month	9000mi/ 14500km or 18 month	12000mi/ 19300km or 24 months	15000mi/ 24000km or 30 months	18000mi/ 29000km or 36 months
Drive chain							
Check the sag of the chain and adjust it if necessary. Check for excessive wear and damage and replace it. Clean and lubricate.	√	√	√	√	√	√	√
Drive sprocket							
Check the wear and replace it if necessary. Replace if there is abnormal sound. Whether the chain guide or tensioner is replaced.	√	√	√	√	√	√	√

DAILY MAINTENANCE AND REGULAR MAINTENANCE SERVICE TIPS

- Maintenance items and intervals -

Maintenance items	Mileage/interval (whichever comes first)						
	600mi/ 1000km or 3 months	3000mi/ 4800km or 6 months	6000mi/ 9600km or 12month	9000mi/ 14500km or 18 month	12000mi/ 19300km or 24 months	15000mi/ 24000km or 30 months	18000mi/ 29000km or 36 months
Standard fasteners							
Check whether all standard fasteners and connectors are loose, broken or falling off. Reinforce or adjust standard fasteners and connectors.	√	√	√	√	√	√	√

Routine maintenance and regular maintenance is very important to ensure that your vehicle is always in the best performance. How to properly maintain the parts is the key to maintain the best performance of the vehicle. Therefore, if you cannot identify the source and quality of the parts, it is recommended to use the original VMOTO parts. Inappropriate maintenance may lead to unexpected problems in later use. Unless you have appropriate tools, service data, machinery maintenance qualifications and original parts, we recommend that your vehicle should be maintained VMOTO authorized distributor.

- Fault Code -

Fault Code	Causes	Methods
ER-04	Alarm for cell voltage difference: single cell voltage of the battery is greater than or equal to the threshold.	Automatically recover; contact after-sales service center or distributor.
ER-05	Alarm for great cell voltage difference: single cell voltage of the battery is greater than or equal to the threshold.	Contact after-sales service center or distributor.
ER-11	Voltage protection for cell charging: the charging voltage of single cell is greater than or equal to the threshold set by the cell overvoltage protection valve.	Automatically recover; contact after-sales service center or distributor.
ER-14	Voltage protection for cell discharging: the discharging voltage of single cell is less than or equal to the threshold set by the cell undervoltage protection valve.	Recover by recharging and turning on again; contact after-sales service center or distributor.

- Fault Code -

Fault Code	Causes	Methods
ER-17	High charging temperature protection: the battery charging temperature rise is greater than the set protection value.	Recover by turning on again; contact after-sales service center or distributor.
ER-22	High discharging temperature protection: the battery discharging temperature rise is greater than the set protection value.	Automatically recover; contact after-sales service center or distributor.
ER-25	Low discharging temperature protection: the ambient temperature is lower than the minimum protection value for battery discharge.	Recover by turning on again; contact after-sales service center or distributor.
ER-28	Large temperature difference protection: temperature rise causes the temperature difference between battery cells to be higher than the set average protection value.	Automatically recover; contact after-sales service center or distributor.

- Fault Code -

Fault Code	Causes	Methods
ER-29	Charging overcurrent protection: the charging current is greater than or equal to 5A.	Recover by turning on again and discharging; contact after-sales service center or distributor.
ER-32	Three-stage protection for discharge overcurrent: the discharge current is greater than or equal to the set value.	Recover by turning on again and charging; contact after-sales service center or distributor.
ER-33	Pre-charge failure protection.	Turn on the switch again; contact after-sales service center or distributor.
ER-35	Charger handshake failure protection: the charger is not matched with the battery in information.	Reconnect and match.

- Fault Code -

Fault Code	Causes	Methods
ER-36	Temperature sensor failure (short or open circuit).	Power on and re-detect; contact after-sales service center or distributor.
ER-37	Voltage detection failure (open circuit of cell).	Power on and re-detect; contact after-sales service center or distributor.
ER-38	MOS failure.	Power on and re-detect; contact after-sales service center or distributor.
ER-39	AFE detection failure.	Power on and re-detect; contact after-sales service center or distributor.
ER-100	IGBT fault: the MOS tube of the controller is short-circuited.	Contact after-sales service center or distributor.

- Fault Code -

Fault Code	Causes	Methods
ER-101	Hardware overcurrent: hardware trigger.	Contact after-sales service center or distributor.
ER-105	Motor resolver fault: encoder failure.	Contact after-sales service center or distributor.
ER-106	Phase loss of motor output: the current different detected among U, V and W phases is large.	Contact after-sales service center or distributor.
ER-107	Current detection fault: Hall current reference deviation.	Contact after-sales service center or distributor.
ER-108	Data fault: reading error of power-on parameters.	Contact after-sales service center or distributor.

- Fault Code -

Fault Code	Causes	Methods
ER-110	Self-check fault of right throttle grip: the throttle does not return to zero, and the throttle voltage is out of the set range.	Turn to zero and keep it for 3S; contact after-sales service center or distributor.
ER-111	LV software undervoltage.	Contact after-sales service center or distributor.
ER-112	Software overcurrentt: the phase current calculated by the software is too large.	Contact after-sales service center or distributor.
ER-113	General undervoltage: the battery voltage is less than or equal to 60V.	Restart after charging; contact after-sales service center or distributor.
ER-114	Severe undervoltage: the battery voltage is less than or equal to 50V.	Contact after-sales service center or distributor.

- Fault Code -

Fault Code	Causes	Methods
ER-115	General overvoltage: the battery voltage is greater than 90V.	Recover after the battery voltage is less than 80V; contact after-sales service center or distributor.
ER-116	Severe overvoltage: the battery voltage is higher than 95V.	Contact after-sales service center or distributor.
ER-118	Controller overload: the peak torque is kept for a long time.	Automatically recover after the torque is reduced: contact after-sales service center or distributor.
ER-121	Overspeed: the speed is greater than 1.1 times peak speed.	Contact after-sales service center or distributor.
ER-122	Bus timeout: the BMS message is interrupted for 500ms.	Automatically recover; contact after-sales service center or local distributor.

- Fault Code -

Fault Code	Causes	Methods
ER-123	General IGBT overtemperature: the controller temperature is higher than 80℃.	Recover after the controller temperature is less than 75℃; contact after-sales service center or local distributor.
ER-124	Severe IGBT overtemperature: the controller temperature is higher than 80℃.	Contact after-sales service center or local distributor.
ER-129	General motor overtemperature: the motor temperature is higher than 135℃.	Recover after the motor temperature is less than 130℃; contact after-sales service center or local distributor.
ER-130	Severe motor over-temperature: the controller temperature is higher than 150℃.	Contact after-sales service center or local distributor.

- Fault Code -

Fault Code	Causes	Methods
ER-131	Throttle grip out-of-range: throttle grip signal is short-circuited or open-circuited.	Automatically recover; contact after-sales service center or local distributor.
ER-145	IGBT temperature sensor fault.	Contact after-sales service center or local distributor.
ER-146	Motor temperature sensor fault.	Contact after-sales service center or local distributor.

MAINTENANCE RECORD
Content:

Date:

MAINTENANCE RECORD
Content:

Date:

MAINTENANCE RECORD
Content:

Date:

MAINTENANCE RECORD
Content:

Date:

MAINTENANCE RECORD
Content:

Date:

MAINTENANCE RECORD
Content:

Date:

MAINTENANCE RECORD
Content:

Date:

MAINTENANCE RECORD
Content:

Date: