

S I A L

E C N

R E U

iTank



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Preface

This maintenance manual will introduce you the info. On the vehicle specification, maintenance procedure, adjustment and diagnosis of iTank.

The employee of service provider authorized by Zhejiang Doohan Technology Co., Ltd. can provide better service to iTank users after having knowledge of this manual and the maintenance technology report which will be published afterwards.

It is advised that the brand name products or tools for specific use should be obtained via Zhejiang Doohan Technology Co., Ltd.

Entries must be received by 30 August 2016.

Without the written permission of Zhejiang Doohan Technology Co., Ltd., no one shall publicize any part of the manual in any form.

Warning

Warning: To reduce the possibility of personal and/or property damage, the following instructions must be followed:

The maintenance manual provided by Zhejiang Doohan Technology Co., Ltd. is compiled for qualified professional technicians. If, any attempt to repair or maintain the vehicle without proper training and appropriate tools and equipment may lead to vehicle damage or abnormal operation of the vehicle.

The maintenance procedures recommended and introduced in the manual are effective methods for maintenance and repair. Of which, some procedures need to use tools specially designed for them.

Hence, if anyone wants to use replacement, maintenance or tools which are not recommended or recognized by Zhejiang Doohan Technology Co., Ltd., he/she must make sure that they are not harmful for the personal safety and safe operation of the vehicle.

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Chapter 1. The vehicle information

Principal dimension			
Vehicle length	1780mm	Vehicle width	730
Vehicle height	1030mm	Wheelbase	1250
Track front	460mm		
Main performances			
Curb mass	99kg	Highest esign	First gear 25km/h
Rated voltage	60V	Vehicle Speed	Second gear 45km/h
Maxim load weight	160kg	Breaking distance (Dry land)	≤2m(20km/h)
Personnel quota	1 person		≤3.5m(30km/h)
Climbing ability	≥25% (Loading 80KG)	Breaking distance (Wet land)	≤3m(20km/h)
standard power consumption	1.7KW/h		≤4m(30km/h)
Economic journey continuation mileage	45KM(45km/h) 70KM(25km/h)		
Car frame			
Front shock absorber	Sleeve, oil damping type		
rear shock absorber	Sleeve, oil damping type		
Front wheel specification	80/100-12×2 or 90/90-12×2		
rear wheel specification	120/70-12		
Front brake method	160mm disc double-piston hydraulic plate brake		
Rear brake method	190mm disc double-piston hydraulic plate brake		
Minimum ground clearance	130mm		

battery system	
Battery type	18650 ternary lithium battery
Voltage	60V
Capacity	26AH
Standard charging current	4A
Maximum discharge current:	75A
Standard time of charging	6H~7H
Maximum mileage	100KM (20km/h)
Capacity of single battery cell	2600mAh
Battery weight	9KG
Time of charging and discharging of	600 times
Temperature range for battery use	-20°C to 60°C
Temperature range for battery storage	-20°C to 60°C
Temperature range for battery charging	0°C to 45°C
Battery protection system	over discharge protection, short circuit protection, temperature over charge protection, overcurrent protection, battery b
battery bunker cover material	Aluminum plate
Power system	
Motor type	Bosch customized electrical machine
Motor controller	Sine wave controller
Maximum speed and no load power, efficiency of motor	540rpm/5.66w/4.1%
Rated power, and speed, efficiency of the	1500W/507rpm/88.1%
maximum power, and speed, efficiency of motor	1863W/512rpm/88.2%
maxim torque and speed, efficiency of	121N·m/40rpm/26.1%
Maximum recoverable energy	10%~15%

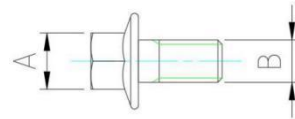
Chapter 2 Standard component specification and general torque

This chapter is used to inform the customers the specification of the standard components the vehicle uses and their corresponding repair tools.

Specify the locking torque force for standard fixtures according to ISO standard screw thread depth. The manual has already explained the locking torque force of the special components or assembly in relevant chapters. In order to prevent curling, please lock the multi-fixture assembly to designated torque force in cross mode and progressive manner. Unless otherwise prescribed, the locking torque should be based on clear and dry screw thread; the components should maintain the room temperature standards.

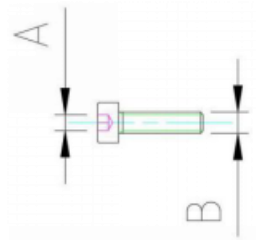
1、 The car uses hexagon flange bolt, whose national standard number is GB/T 5789-2000. For the standard component specification, repair tools specification and general torque please refer to the following table:

A	B(specifications)	Open spanne r/s leeve	General torque N.m
10mm	M6	10#	10-15
12mm	M8	12#	25-35
15mm	M10	15#	40-50
18mm	M12	18#	50-60



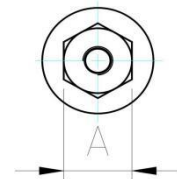
2. The car uses inner hexagon flange bolt, whose national standard number is GB/T70.1-2000. For the standard component specification, repair tools specification and general torque please refer to the following table:

A	B(specifications)	Inner hexagonal wrench	General torque N.m
4mm	M5	4#	5-10
5mm	M6	5#	10-15
6mm	M8	6#	25-35
8mm	M10	8#	40-50
12mm	M14	12#	60-70



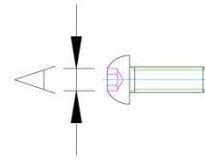
3. The car uses hexagon flange bolt whose national standard number is GB/T 6177.1-2000, and hexagon locking-nuts with flange, whose national standard number is GB/T6187.1. For standard component specification, repair tool specification and general torque please refer to the following table:

A	Specifications	spanner/sleeve	torque N.m
8mm	M5	8#	5-10
10mm	M6	10#	10-15
13mm	M8	13#	25-35
15mm	M10	15#	40-50
18mm	M12	18#	50-60



4. The car uses inner hexagon flange bolt, whose national standard number is GB/T70.2-2000. For the standard component specification, repair tools specification and general torque please refer to the following table:

A	Specifications	Inner hexagonal wrench	General torque N.m
3mm	M5	4#	5-10
4mm	M6	5#	10-15



5. The car uses cross recessed pan head tapping screws which national standard number is GB/T 845-1985, GB/T818-2000 cheese head screws with cross recess, the repair tools are uniformed as cross screwdriver There are no requirements for torque force, screwing down will be enough.

Chapter 3 Dismantle and replacement of parts of the car

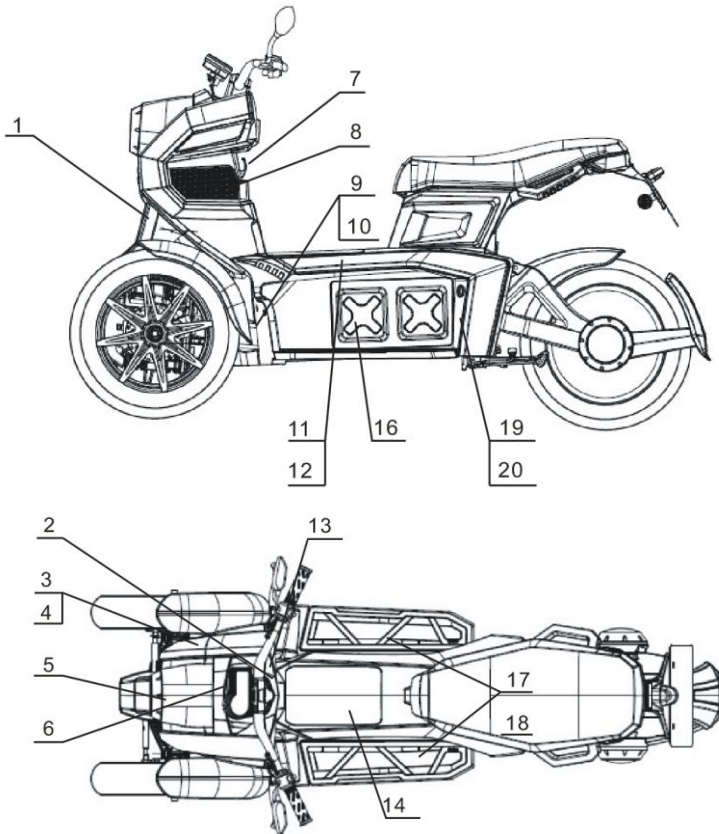
Preparation for dismantling and replacement

- ① Before the dismantling or removal, clean the dust, dirt and foreign matter on the car.
- ② While dismantling, the paired parts must be put together. The paired parts must be used repeatedly or switched in pairs
- ③ While dismantling, clean all the parts, and put them on the tray in the order of dismantling sequence. Doing so will save the time of assembling and ensure the correct installation of the parts.
- ④ Put all parts in places away from fire and water.



3.1 Disassemble and switch the covering parts

3.1.1 Schematic diagram of the covering parts



3.1.2 Procedure of dismantling and switching the covering pieces and the tools required

Cross screwdriver



10#Solid wrench



5#Internal hexagonal wrench



Workse quence	Name of parts	Standard components	Quantity	Special
1	前面板下部	ST4.2×12 (头部Ø10)	3	十字螺丝
		ST4.8×12 (头部Ø12)	2	十字螺丝
		M6×16 (头部Ø10) 内六角平圆头螺栓	2	十字螺丝
2	前置物箱装饰件	/	/	
3、4	前置物箱左、右装饰件	ST 4.8×16自攻螺丝	2	十字螺丝
5	前面板总成	ST 4.2×12自攻螺丝	2	十字螺丝
		ST 4.2×16自攻螺丝	4	
		Ø6×Ø18×1.5平垫片	2	
		ST4.2 (外形11×17) 卡片	2	
		M6×16六角法兰面螺栓	2	10#套筒
6	前置物箱上盖	ST 4.2×16自攻螺丝	6	十字螺丝
7	安全帽挂钩	M6×20内六角圆柱头螺栓	1	5#内六角
8	前置物箱	ST 4.2×12自攻螺丝	2	十字螺丝
		ST4.2 (外形11×17) 卡片	8	

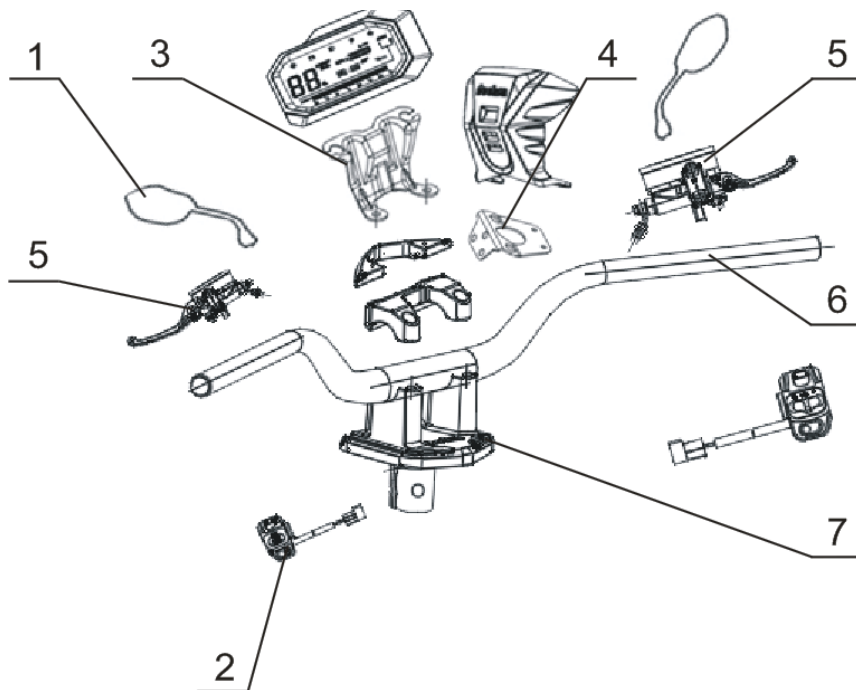
Workse quence	Name of parts	Standard components	Quantity	Special
9、10	车架左、右挡泥板	ST 4.2×12自攻螺丝	6	十字螺丝
		ST 4.8×16自攻螺丝	2	
11、12	左、右装饰板装饰条	/	/	/
13	置物箱后装饰板	ST 4.8×16自攻螺丝	6	十字螺丝
14	前电池仓盖	M6×10内六角平圆头螺栓	3	5#内六角
15	装饰板上盖	ST 4.8×16自攻螺丝	8	十字螺丝
16	后电池仓盖	M6×10内六角平圆头螺栓	3	5#内六角
17、18	左、右脚踏板	M6×12六角法兰面螺栓	6	10#套筒
		Ø6弹簧垫圈	6	
		Ø6平垫片	6	
19、20	左、右装饰板	ST 4.2×12自攻螺丝	8	
		M6×16六角法兰面螺栓	3	

Notes:

- Use appropriate support to support the car, so that the front wheel will hang in the air.
- Dismantle the parts in order. While installing, follow the sequence in an opposite direction of the dismantling process.
- If the solid wrench is not applicable, you can switch to sleeve or speed wrench of the same specification.

3.2 Disassembling and changing of steering handle

3.2.1 Schematic diagram of the steering handle



3.2.2 Tools required to change and disassembling the steering handle base order

作业顺序	零件名称	标准件	数量	
1	左右后视镜	/	/	14#开
2	左右组合开关	十字槽小盘头螺钉（开关自带）	4	十字
3、4	仪表上下支架	M5×10内六角圆柱头螺钉	4	5#内六角
		Ø6平垫	4	
4	方向把压块	M8×25内六角圆柱头螺钉	4	6#内六角
5	前后碟刹上泵	M6×20六角法兰面螺栓（开关自带）	4	8#
6	方向把	/	/	
7	方向把座	M10×1.25×50六角法兰面螺栓	1	12#
		Ø10×Ø21×11方向把锁紧套	1	14#

●If the solid wrench is not applicable, you can switch to sleeve or speed wrench of the same specification.

3.2.3 Change the steering handle base

① Place iTank on a flat platform ②Dismantling steps:

●Lower part of the front panel

●Front storage box trimming : Clutch on one end of the front storage box trimming, pull it down with great force.

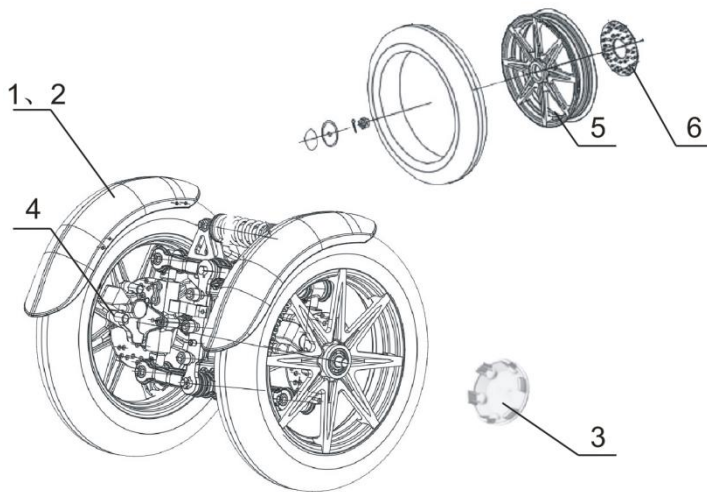
●Front storage box left trimming: After twisting the screw, Clutch on one end of left trimming of the front storage box, pull it down with great force.

- Right trimming of front storage compartment : Same as the above
- Front panel assembly
- Upper cover of front storage compartment
- Refer to "Disassemble the covering pieces".
- Handlebar block
- Handlebar seat

③ After changing the steering handle base, install according to the order opposite to the disassembly

3.3 The front wheel and front disc brake system

3.3.1 The front wheel and front disc brake system map



3.3.2 Tools needed to disassemble and switch the front wheel, front disc brake system and the order of disassembling and switching

作业顺序	零件名称	标准件	数量
1	左、右前轮挡泥板	M5×16十字槽圆头螺钉（头部Ø9）弹簧垫圈GB/T 93 d=5	4
3	前轮轴装饰件	/	/
4	前碟刹下泵	M8×1.25×22内六角圆柱头螺栓	4
5	前轮	非标ø10×ø21×11开槽螺母、 ϕ 20×35开口销	2

Notes:

Use appropriate support to support the car, so that the front wheel will hang in the air.

Dismantle the parts in order. While installing, follow the sequence in an opposite direction of the dismantling process.

If the solid wrench is not applicable, you can switch to a sleeve or speed wrench of the same specification.

3.3.3 The check of front and back tyres

①Tyre inspection

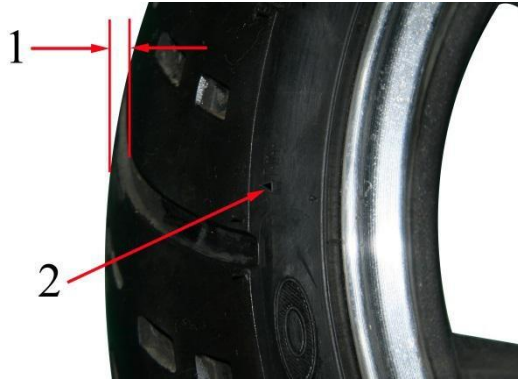
(1)Tire pressure

Exceeded the standard value ($225\pm 10\text{KPa}$), please adjust the tyre pressure.

Warning:

- Please check and adjust the tyre pressure when the exterior tyre temperature equals to the outdoor temperature.
- Driving an overloaded iTank will lead to the damage of the tyre or accidental injury
- Don't overload the iTank

(2) The surface of the exterior tyre is as follows



I the depth of the tyre lines II Abrasion

indicator

The minimum depth of the of the exterior ty	
Front wheel	Rea

If there are damages or wears, please switch.

Warning:

● Better not try to revamp a pierced tyre. If this must be done, please be as carefully as possible and switch a high-quality tyre as soon as possible.

② Check the wheel rim and the disc brake plate

(1) Wheel rim

If there are damages or wears, please switch.

Warning:

● Do not repair a damaged or distorted wheel rim, replace them with new ones.

(2) The plate of disc brake is as follows

If the thickness of the plate of disc brake disc is beyond the standard values, please replace the disc brake disc.

The limit of the disc brake's



(3) Hydraulic braking head is as follows

If the thickness of the front and back hydraulic braking head A exceeds the standard value, please switch.

The thickness use limit of the

Warning:

- When the braking head on one side is worn to the usage limit, the whole braking head unit must be switched.



3.3.4 Disassemble and replace the front disc brake lower pump

① Put the iTank on a flat platform, then use appropriate support to support the iTank to make the front wheel be above the ground, and do not let it overset.

② Dismantling steps:

- Mud guard of left front wheel
- Front wheel axle decorating parts
- The lower pump of the front disc brake

Refer to "Front wheel and front disc brake system".

③ After changing the lower pump of the disc brake, install according to the order opposite to the disassembly

3.3.5 Disassemble and change the front wheel and front disc brake plate

① Put the iTank on a flat platform, then use appropriate support to support the iTank to make the front wheel be above the ground, and do not let it overset.

② Dismantling steps:

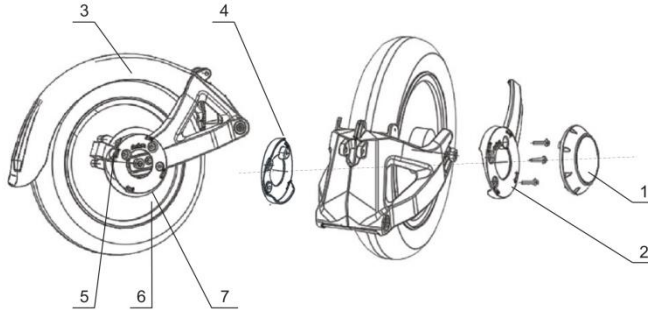
- Mud guard of right front wheel
- Front wheel axle decorating parts
- The lower pump of the front disc brake
- Front wheel
- Front disc brake plate

Refer to "The front wheel and front disc brake system".

③ After changing the front wheel and front disc brake plate, install in the order opposite to the disassembly

3.4 The rear wheel and rear disc brake system

3.4.1 The rear wheel and back disc brake system map



3.4.2 Tools needed to disassemble and switch the rear wheel, rear disc brake system and the order of disassembling and switching

作业顺序	零件名称	标准件	数量
1	后平叉护盖	M5×12内六角圆柱头螺钉	4
2	左右平叉护盖支架	M6×16六角法兰面螺栓	6
3	后泥板	M6×12六角法兰面螺栓	2
4	后泥板支架	M6×12六角法兰面螺栓	2
		M6×16六角法兰面螺栓	1
5	后碟刹下泵	M8×30六角法兰面螺栓	6
6	电机	M16螺母	4
		M10×1.25×25六角法兰面螺栓	2

Notes:

- Use appropriate support to support the car, so that the front wheel will hang in the air.
- Dismantle the parts in order. While installing, follow the sequence in an opposite direction of the dismantling process.
- If the solid wrench is not applicable, you can switch to sleeve or speed wrench of the same specification.

3.4.3 Disassemble and replace of the lower pump of the rear disc brake

- ① Put the iTank on a flat platform, then use appropriate support to support the iTank to make the front wheel be above the ground, and do not let it overset.
- ② Dismantling steps:
 - Fork protective cover
 - Lower pump of the rear disc brake

Refer to "The rear wheel and rear disc brake system".

3.4.4 Disassemble and switch split back splash guard

① Place iTank on a flat platform

② Dismantling steps:

- Fork protective cover: use slot type screwdriver to prize the fork protective cover
- Back mud guard support
- Fork protective cover support
- Back mud guard
- Back mud guard support

Refer to "The rear wheel and rear disc brake system".

③ Install split back splash guard:

- Back wheel splash guard
- Back fork splash guard

④ After switching, install in the order opposite to the disassembly order

3.4.5 Disassemble and change the rear wheel and rear disc brake plate

① Put the iTank on a flat platform, then use appropriate support to support the iTank to make the front wheel be above the ground, and do not let it overset.

②Dismantling steps:

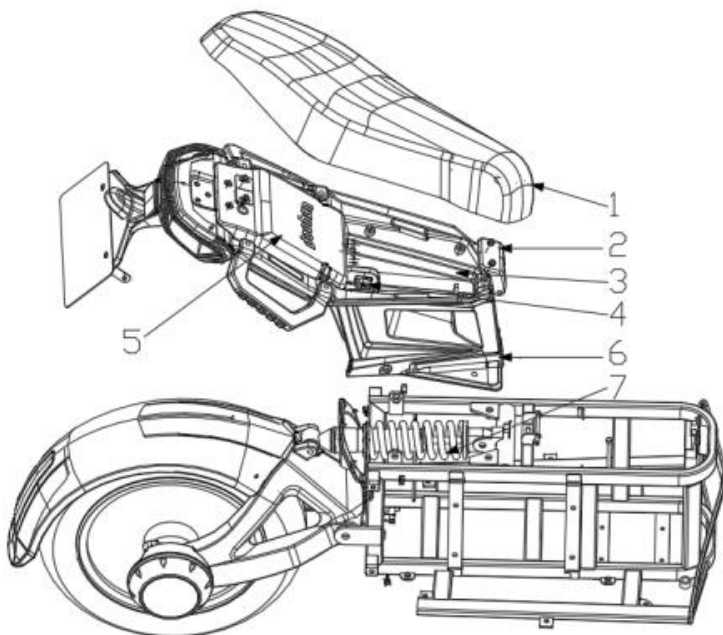
- Fork protective cover
- Back mud guard support
- Fork protective cover support
- Back mud guard
- The lower pump of the rear disc brake
- Motor
- Rear disc brake plate

Refer to "The rear wheel and rear disc brake system".

③ After changing the rear wheel and rear disc brake plate, install in the order opposite to the disassembly

3.5 The seat tank and the rear cushion

3.5.1 Schematic diagram for The seat tank and the rear cushion



3.5.2 Tools needed to disassemble and switch the sitting tank and rear cushion and the order of disassembling and switching

作业顺序	零件名称	标准件	数量	专
1	座垫	六角法兰面螺母M6	2	
2	座垫铰链	座垫铰链轴	1	
		座垫铰链轴卡簧	1	
3	座桶内盖	内六角圆柱头螺栓M5×8	4	
4	电池仓AB开关座	内六角平圆头螺栓M6×12	3	
5	控制器上盖	内六角平圆头螺栓M5×10	5	
6	座桶	六角法兰面螺栓M10×1.5×30	2	
		内六角圆柱头螺栓M10×1.5×30	2	

Notes:

Dismantle the parts in order. While installing, follow the sequence in an opposite direction of the dismantling process.

If the solid wrench is not applicable, you can switch to sleeve or speed wrench of the same specification.

3.5.3 Disassemble and changing sitting tank

① Place iTank on a flat platform

② Dismantling steps:

- Lower part of the front panel
- Trimming of front storage compartment
- Left trimming of front storage compartment
- Right trimming of front storage compartment
- Front panel assembly
- Upper cover of front storage compartment
- Hook for the safety helmet
- Front storage compartment
- Left mud guard of bicycle frame
- Right mud guard of bicycle frame
- Trim bar of left trim plate

- Trim bar of right trim plate
- Rear trim plate of storage compartment
- Front battery bunker cover
- Upper cover of trim panel
- Rear battery bunker cover
- Left trim panel
- Right trim panel

Refer to "Disassemble the covering pieces".

- The inner cover of the seating tank
- Battery bunker AB switch base
- Upper cover of controller
- Sitting tank

③ After changing the sitting tank , install according to the order opposite to the disassembly

3.5.4 Disassemble and changing rear cushion

① Place iTank on a flat platform

②Dismantling steps:

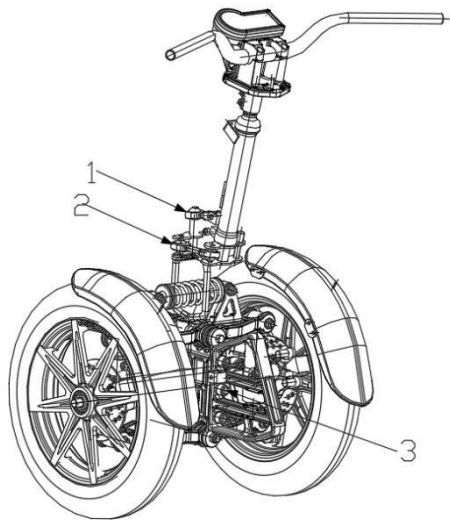
- Refer to "Disassemble and changing sitting tank

- Rear cushion

③ After changing the rear cushion, install according to the order opposite to the disassembly

3.6 The front mechanism

3.6.1 The connection of the front mechanism to the frame



3.6.2 Procedure of dismantling and switching the front mechanism and the tools required

作业顺序	作业名称	标准件规格	数量
1	正转向机构与车架	六角法兰面螺栓M10×1.25×50	1
		六角法兰面自锁螺母M10×1.25	1
2	方向调整拉杆与车架	六角头螺栓M10×1.25×56（定制）	1
		六角法兰面自锁螺母M10×1.25	1
		不锈钢衬套φ10*φ12*3.5	2

Notes:

- Use appropriate support to support the car, so that the front wheel will hang in the air.
- Dismantle the parts in order. While installing, follow the sequence in an opposite direction of the dismantling
- If the solid wrench is not applicable, you can switch to sleeve or speed wrench of the same specification.

3.6.3 Disassemble and switch the front mechanism (the whole machine)

① Put the iTank on a flat platform, then use appropriate support to support the iTank to make the front wheel be above the ground, and do not let it overset.

②Dismantling steps:

- Lower part of the front panel
- Trimming of front storage compartment

- Left trimming of front storage compartment
- Right trimming of front storage compartment
- Front panel assembly
- Upper cover of the front storage compartment
- Hook for the safety helmet
- Front storage compartment
- Left mud guard of bicycle frame
- Trim bar of left trim plate
- Trim bar of right trim plate
- Rear trim plate of the storage compartment
- Front battery bunker cover
- Upper cover of trim panel
- Rear battery bunker cover

- Left trim panel

Refer to "Disassemble the covering pieces".

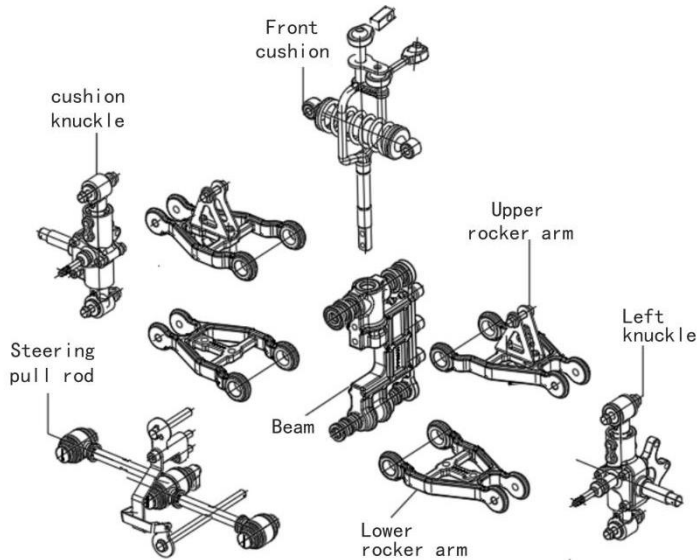
- Mud guard of front wheel
- Front wheel axle decorating parts
- The lower pump of the front disc brake
- Front wheel

Refer to "Disassemble and changing of front wheel"

- Right steering mechanism and frame
- The direction-adjusting pull rod and frame
- Front mechanism and frame

③ After changing the front mechanism, install according to the order opposite to the disassembly

3.6.4 Front mechanism exploded views (components)



3.6.5 Disassemble and change steering linkage assembly

① Put the iTank on a flat platform, then use appropriate support to support the iTank to make the front wheel be above the ground, and do not let it overset.

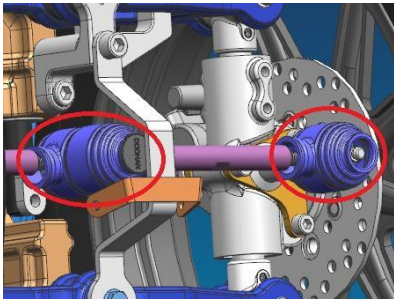
② Dismantling steps:

- Lower part of the front panel

- Rubber sleeve seal cartridge cut off the ribbon that binds the bearing rubber case
- Steering linkage assembly Pull the bearing dust prevention rubber case on in the circle of the picture below to the inside to display the knuckle bearing at the end of the rod, Then take off the left steering base, connecting rod of the steering column and the cotter of the right steering base separately, and use a 16# wrench to unscrew the three M10 open slot nuts, take out the steering linkage assembly and use a 16# wrench to unscrew the three M10 open slot nuts, take out the steering linkage assembly

Steering linkage assembly

- ③ Change the steering linkage assembly in the opposite order of disassembly



3.6.6 Disassembly and change the steering base

Notes:

- The steering base is divided into left steering base and right steering base, if you want to change the left steering base, you only need to disassemble the parts connected to the left steering base, and the same for switching right steering base.

- ① Put the iTank on a flat platform, then use appropriate support to support the iTank to make the front wheel be above the ground, and do not let it overset.

- ② Dismantling and switch procedure:

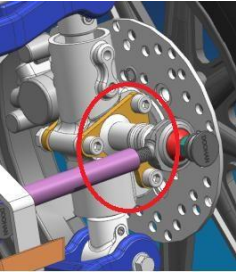
- Lower part of the front panel

- Rubber sleeve's seal cover

- Steering linkage assembly: take off the rod end knuckle bearing at the side of the steering base that needs to be switched

Refer to "Disassemble and switch steering linkage assembly"

- Steering base: unscrew the 3 bolts in the circle of the picture below



- ③ Change the steering base in the order opposite to the disassembly

3.6.7 Dismantling and change knuckle

Notes:

- There are right and left knuckles, if you want to change knuckle on one side, you only need to dismantle parts connected to it.
- ① Put the iTank on a flat platform, then use appropriate support to support the iTank to make the front wheel be above the ground, and do not let it overset.
 - ② Dismantling and switch procedure:

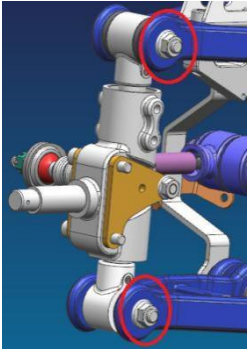
- Mud guard of front wheel
- Front wheel axle decorating parts
- The lower pump of the front disc brake
- Front wheel

Refer to "Front wheel and front disc brake system".

- Lower part of the front panel
- Rubber sleeve's seal cover
- Steering linkage assembly

Refer to "Disassemble and switch steering linkage assembly"

- Knuckle Firstly take off the cotter in the circle of the picture below, then unscrew the bolt



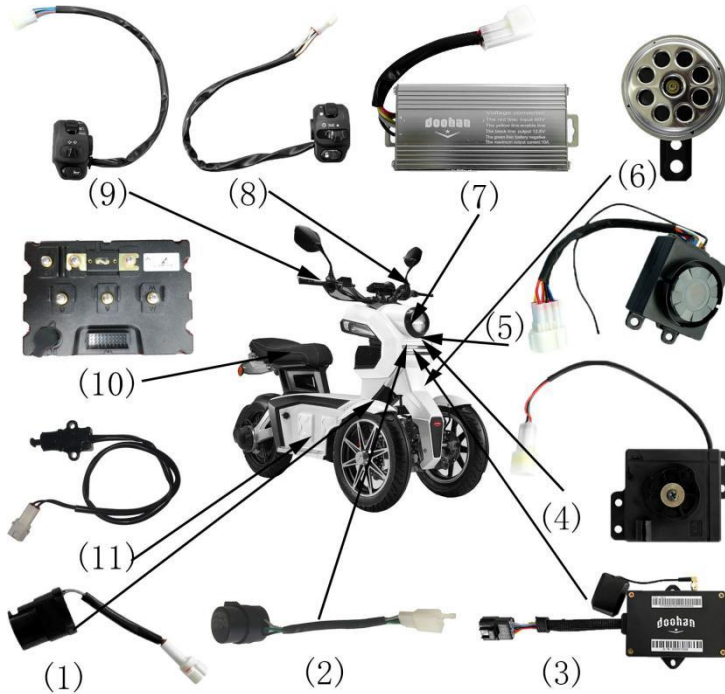
③ Change the elevation in the order opposite to the disassembly

Chapter 4 An introduction to electrical parts and their repair

4.1 Electric device

(1) Buzzer (2) Flasher (3) VCU (4) Accelerator (5) Burglar alarm (6) Horn

(7) DC-DC converters (8) Left switch (9) Right switch (10) Controller (11) Kick stand shut-down switch



4.2 An introduction of the electrical parts

Cell:

Cell is the on-mobile power providing energy to the electromobile. The batteries of the electro mobiles produced by our company all uses 18650 ternary battery of the Japanese and Korean system. The total capacity of the battery pack is improved by series connection. The total pressure is improved by parallel connection. The management of the battery pack is realized by BMS, which realizes overdischarge protection, overcurrent protection, temperature protection, short circuit protection, balance of battery cell pressure differences, SOC electric quantity display, CAN communication, automatic dormancy and no output of the battery when the output current is lower than 2A, hot plug of the battery plug, and the K—(electric door lock) controlled battery output. Advise: If the vehicle will not be used for a long period, please disconnect the battery plug with the vehicle.

Controller:

Controller is the part which controls the electric machine's speed, it is also the core of the electromobile's electrical system. It uses FOC vector control technology.

The starting noise is small. And the vehicle has undervoltage, current limit and overcurrent protection functions. Applying the brake during the driving process can recover the energy by using electrical machine as the generator.

Electrical machine:

Electrical machine transforms battery's electrical power into mechanical energy to drive the wheels of the electromobile. The electrical machine that our company's electromobile uses is three phase direct current brushless hub electrical machine. It is composed of rotors, stators, magnetic steel, Hall element, etc. It is highly efficient and with a small noise.

Charger:

The charger is the devices which replenish the electrical power of the batter. The charger of the electromobile produced by our company is connected to the batter. While charging the battery, you need to connect the charger output and the battery first, before

connecting the input end of the charger to the, or else the charger will not be launched into charging state; the charge has precharge function. When the pressure of the battery is lower than 4.45V and higher than 35V, it will enter into precharge state. When the batter pressure is higher than 46.4V, it will enter into normal charging state.

DC-DC Transverter

DC-DC converter converts the battery pressure into 12V pressure to finish the electrical device power supply of 12V working pressure which the vehicle needs, such as instruments, lights and horns. The converter 12V output is controlled by enable line (electrical door lock), so as to avoid the electrical door lock to sustain instant large current impact.

Brake and kick stand outage switch:

The braking part of the electromobile, used simultaneously with the brake handle. It performs the function of braking to stop the electrical machine from operating. The stoplight is synchronously lit up (under the circumstance that the vehicle is powered on.

VCU:

VCU is the vehicle's central control system. It is used as the part of the vehicle for receiving and sending data. SIM card, GPS orientation module and gyroscope is set within it. For example, when a vehicle's location changes, check the location via GPS module, send the location to the server via SIM card's network, after processing by the server, the location will be updated to the map on the interface of the APP, at this time, the location of the vehicle can be read by people And the data and status of the vehicle are also updated to the APP in this manner. After detecting any abnormalities (such as turning on one side and toppling over) in the vehicle, the gyroscope will remind the user in the manner of pushing a message. This part contains a built-in battery. When the built-in battery is fully charged, under the circumstance that the vehicle's battery is disconnected with the charger, the built-in battery can still hold for more than 20 hours.

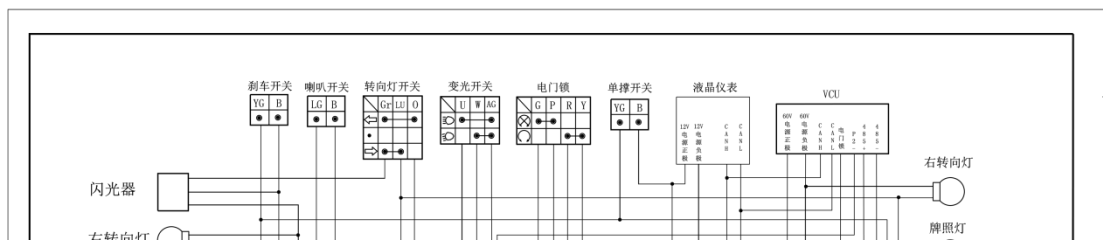
Rolling handle:

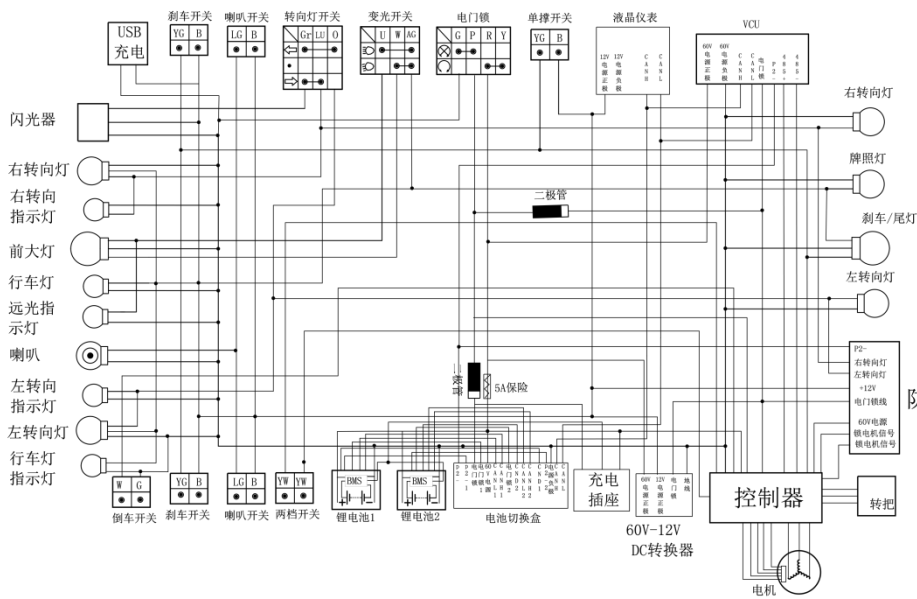
Speed control components of electromobile. After the vehicle is normally powered on, rotate the rolling handle's opening degree to control the rotation and speed of the electrical machine. While using the regulating rolling handle, rotate and put down gently, there is no need to use great force.

Burglar alarm:

The burglar alarm has the functions of searching for the car, burglar alarming and locking the electrical machine.

4.3 Electrical principle diagram





防盗器

iTank双电池出口电气原理图

符号 R G U W B Y N Gr LU O LG K AG P YW
 颜色 红 绿 蓝 白 黑 黄 棕 灰 浅蓝 橙 浅绿 粉红 军绿 粉色 白黄

4. 4 Faulting phenomenon and repair method

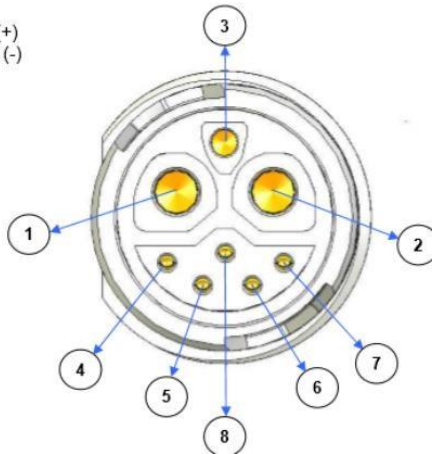
4.4.1 Complete vehicle is out of electricity

① The battery is out of electricity:

a. Press the button of indicator light; observe whether the indicator light is turned on, if the red light is always on than the electricity is at its lowest, if the red light flickers than the battery is out of electricity.

b. Use a wire to short-circuit the positive pole ① foot of the battery and the K-⑧ foot of the battery, the pressure of the positive pole ① foot of the battery and the negative pole ② measured should be higher than 50V, or the battery will have no electricity, the battery needs to be charged, the following map is the output connector of the battery:

1. Charge / Discharge Positive (+)
2. Charge / Discharge Negative (-)
3. Charge (-)
4. GND
5. CAN_H
6. CAN_L
7. P2-
8. K-



c. If after the battery is fully charged, the battery pressure is still very low after being tested according to the “a” and “b” step, then the battery is faulty, it needs to be vamped and switched.

② The battery has electricity, when it is connected to the vehicle, the vehicle has no electricity

a. If the battery has electricity, after connecting it to the vehicle's battery plug, opening the electrical door lock, the vehicle has no electricity, check whether the battery plug has already been reliably connected, restart the connecting confirmation

b. After ascertaining that the battery and the vehicle are reliably connected, open the electrical door lock, the vehicle still has no electricity, then measure whether the negative and negative pole of the charging port of the vehicle has electricity(having the same pressure with the battery port), under the circumstance that the electrical door lock is open, turn the multimeter to 200V direct voltage, measure whether the pressure of the positive ① foot and the negative ③ foot of the battery are the same as the pressure of the battery port

c. If the pressure is over low or there is no pressure, it means that the battery has no normal output, check whether the fuse 70A and 5A of the vehicle are fused(disconnect the battery first), the fuse of 5A is in the cover of the controller under the cushion, it can only be seen when it cover is uncovered, if the 70A fuse is fused, check whether the controller has been burned out, if 5A's fuse is fused, then check whether DC converter has been burned out

① The methods to measure the controller

Ascertain that the battery is disconnected with the battery plug, open the line ball cover of the controller, turn the multimeter to buzzing, measure whether the negative and positive pole of the controller are in the conducted status(change the red probe and the black probe test to ascertain), if it is conducted, then the controller is burned out, if it is not conducted, then measure whether the negative pole or positive pole of the controller and the phase line are conducted(switch the red probe and the black probe test to ascertain), if they are conducted then the controller has been burned out and needs to be switched

②Methods to measure the DC converter

Similar to the methods of measuring the controller, dismantle the big light part of the vehicle, unplug the converter plug, measure whether the red line of the converter are conducted with the green line or black line. If they are conducted, then the converter has been burned out and needs to be changed

d. When the fault is ascertained, after debugging and switching, reconnect the battery and open the electrical door lock, ascertain whether the vehicle is normal, test whether the pressure of the charging port of the vehicle is normal

e. If the fuse is not fused, check whether the electrical door lock has been burned out, dismantle the large lighting parts of the vehicle, unplug the electrical door lock plug, turn the multimeter to buzzing, in the state where the electrical door lock is open, measure whether the red line and the black line at the electrical door lock end are conducted, if they are not conducted, it means that the electrical door lock is burned out and needs to be switched

③ DC converter is burned out

a. The battery output is normal, the instruments, lights and the horn all do not work, the vehicle has no forward gear, and can only back off, at this time the DC converter has burned out, and needs to be switched or repaired

b. The battery output is normal, the instruments, lights and the horn all do not work, but the vehicle can run normally, at this time the DC converter has burned out, and needs to be switched or repaired ④ **The instrument is burned out**

a. The instrument does not work (the screen is black), the vehicle can drive normally, the lights and the horns are normal the instruments are burned out, change the instrument

b. The instrument works (the screen is on), but there are no gears and electricity quantity display, there are no vehicle speed when the vehicle is driving, check whether the VCU functions properly

① Check if the VCU power supply is normal: Since the power of VCU and the burglar alarm are shared, at this time turn off the electrical door lock, operate with the remote

control, press lock, open or search key, to see if they function properly, if they do then the power supply is normal, take the second step

② Disconnect the battery for over 2 minutes, then connect the battery, open the electrical door lock and observe whether the instrument displays normally, connect working personnel to update VCU software remotely;

③ If the abnormality continues after the battery is disconnected, check whether the contact of VCU and the connectors of the instrument are firm, whether the battery plug is sufficiently plugged, re-plug the plug,

④ Check whether the instrument communication is burned out, if the instrument connection is burned out, then the instrument needs to be switched

The table corresponding to the flickering of LED indicator light on the controller

The time LED of flickering	Fault type	Failure description:
1	Overpressure protection	The controller detects that the input voltage is too high

3	Overcurrent protection	Thephaseline of the electrical machineis short out or the phaseline is short out to the power
4	Locked-rotor protection	Theelectrical machine rotation is locked, it cannot function properly
5	HALL Protection	The electrical machine HALL inputi abnormal
6	Powertube protection	The power tube self-checkis abnormal
7	Phaselack protection	One of the phase line of the electrical machine is disconnected
9	Brake state	The controller is in the brake state

4.4.2 Faults phenomenon: Open the electrical door lock, turn the speed regulating handle, the electrical machine doesn't rotate

Failure reason and maintenance program

- ① The battery voltage is too low, the controller enters into undervoltage protection; Charge the battery
- ② Whether the accelerator pull box has been reset Check whether the accelerator bracing wire has been took off from the accelerator pull box, install properly
- ③The accelerator pull box is broken: Change the accelerator pull box;
- ④ The brake switch is not cut off: Check whether the brake handle return is normal or whether the accelerator cutting-off switch is broken, when the brake handle is not pulled or when the kick stand is lifted, if the braking light is not lit up, repair or change the braking switch;
- ⑤ The kick stand cutting-off switch is not cut off: Lift the kick stand, the braking light is always on, repair or change the kick stand cutting-off switch;

⑥The electrical machine HALL plug is not well connected to the controller: Unplug the electrical machine HALL connector, re-plug it;

⑦The electrical machine HALL is burned out: Repair the electrical machine HALL or change the electrical machine

⑧The controller is burned out: Repair or change the controller

4.4.3 Faults phenomenon: After the battery is fully charged, the driving distance is short

Failure reason and maintenance program

①The battery is aging: Switch or revamp the batter;

②Under-inflation Inflate the tyre

③disc brake disc; Repair the disc brake;

④ The charger is faulty, the battery is not fully charged: Change or revamp the charger.

4.4.4 Faults phenomenon: The charging time of the battery is short

Failure reason and maintenance program

- ① The charger is faulty, so the battery is not fully charged: Change or revamp the charger.
- ② The battery socket is aging, the connection is not good: Repair or change the battery.

4.4.5 Faults phenomenon: When the charger is charging the vehicle or battery, after plugging the plug, the charger green light is always on or no light is on and the fan doesn't move, cause of the faulty and methods to repair:

- ① Notice the order of connection between the charger and the battery: Firstly connect the charger output plug with the battery firmly, and then connect the input to the electric supply
- ② The battery temperature is lower than 0 degree or higher than 50 degree: Wait until the temperature of battery is higher than 3 degree or lower than 45 degree;
- ③ The connection between the charging plug and the socket is not firm: Unplug the charging plug, re-plug it, observe the charging status, or change the battery;

④ When the charger and the battery are connected, the indicator light is not on: Change or repair the charger;

⑤The charger is charging the battery, the fan is not moving: Change or revamp the charger.

4.4.6 Faults phenomenon: The battery electricity quantity display is not accurate, it is not displayed as 100% when the battery is fully charged, the display difference is great, cause of the fault and repairing method:

①Conduct full charge and full discharge learning calibration to the battery: Drive the vehicle until it runs out of electricity, when the vehicle is in the state of not being able to used, charge the battery fully, then use it again, do it twice, if there are no improvements than change or repair the battery.

4.4.7 Faults phenomenon: When the faulty “wrench” on the instrument is on, please use the APP to enter into “vehicle status” page to check the vehicle, after the test is finished, look at the detailed test report to analyze the abnormalities of the vehicle, as in the follow table:

System classification	Malfunctions	Solution
Power system	The power valve of the controller is faulty	Check the controller, repair
	The power of the controller drive is faulty	Check the controller, repair
	The overcurrent fault of the controller	① The load is too heavy, current is too large, the type is insufficient ② Check the controller electrical machine, change if necessary
	Voltage of supply is too low or power high or	Please use the specification provided by our company, the voltage of the battery normal, repair or replace
	Controller over-temperature protection	The controller temperature stop the vehicle for a while, controller and electrical down
	The phase line fault of the electrical machine	① Check whether the electrical phase line and the controller is good, ensure that the electrical is not broken or worn, repair the electrical machine
		① Check the connection

Power system	Undervoltage protection	The battery voltage press charge the batter
	Locked-rotor protection	The load is too heavy machine is burned out, the electrical machine.
	The twist grip fault	Check whether the accel broken, change if necessa
	Loosen the end of the twist grip when it is being electrified	Check whether the accel broken, change if necessa
Power supply system	Protectionforthe venting temperature being too high	When the battery temper degree, do not charge it, in the room to make its below 45 degree, then ch
	Protectionforthe venting temperature being too low	When the battery temper degree, do not charge it, in the room to make its over 3 degree, then charg
	Protectionforthe venting temperature being too high	When the battery temp than 63 degree, do nc battery, when the tem battery is lower the discharge it normally
	Protectionforthe venting	When the battery tempe minus 20 degree, do n

Power supply system

Highvoltage protection	When the overall voltage too high, the charging vc when the battery is bein charger, check the cha change it
MOSFETHigh temperature	① When the MOSFET higher than 115 degree battery plug to let temperature in the batter 80 degree ② Check wh burglar prevention pov repair or change
Battery cell overvoltage protection	When the voltage of the battery is too high, chec the charge, repair or repl
Low-voltage protection of the battery packaging	The overall voltage of th low, charge the battery switch
Battery cell undervoltage protection	The Single section bat battery is over low, char repair and switch
Discharging overcurrent protection	The charging current of 26A, check whether the c out, repair or change if ne
Charoingovercurrent	The charging current of

Central control system (VCU)	GPS faults	VCU internal fault, repair
	GPRS faults	VCU internal fault, repair
	The gyroscope is faulty	VCU internal fault, repair
	The power supply is abnormal	VCU internal fault, repair
	The communication with the controller is abnormal	Check the communication controller and the VCU, replace
	The communication with the BMS is abnormal	Check the communication controller and the VCU, replace
		Check the communication

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