

N1S

Operation & Maintenance Manual for Electric Scooter N1S



Jiangsu Niu Electric Technology Co. Ltd

Maintenance Information

The maintenance and reparation information contained in this manual is for technical specialists only.

Maintenance or reparation performed by those who are not trained properly and provided with appropriate tools and equipment may cause injuries to themselves or others and also lead to damages or unsafe conditions of the scooter.

The proper maintenance and reparation procedures, some of which require special tools and equipment, are described in this manual. The risks in terms of personal safety and scooter operation safety, which may be resulted from the use of components, maintenance procedures or tools not recommended by Niu, must be verified.

Please make replacement with original electric components made by Niu or equivalents that have corresponding part numbers. We strongly recommend you not to use inferior components.

Customer Safety Notice

The proper maintenance is crucial for customer safety and scooter reliability. Any errors or omissions in scooter maintenance may result in operating malfunctions, scooter damages or injuries.

Improper maintenance or reparation may lead to unsafe conditions under which serious injuries or even death of your customers or other people may be incurred.

Please carefully follow the procedures and cautions in this manual and other maintenance materials.

Personal Safety Notice

This manual is used only by professional maintenance technicians, and the warning information about multiple basic workshop safety operation procedures (such as the procedure that requires gloves when working on hot components) is not set forth herein. We recommend you not to carry out procedures specified in this manual without readiness if you have not received the workshop safety training or grasped the knowledge about maintenance safety specifications.

The following are listed as several most importance general notes to maintenance safety. However, we are unable to set forth the warning for each of risks that may arise from maintenance and reparation procedures. You have to determine at your discretion whether a detail task should be implemented.

Failure to properly follow relevant instructions and notes may result in serious injuries or even death.

Please carefully follow procedures and notes in this manual.

Importance Safety Notes

Make sure that you have completely understood basic workshop operation safety procedures and taken on proper protective clothes and are provided with safety equipment. Extra attention should be paid to the following in the implementation of a maintenance task:

Read all the relevant instructions before operation, and make sure that you have necessary tools, spare parts, components and skills to implement a maintenance task safely and completely.

There are high-voltage circuits in the scooter system, which can cause electric shock. It must be verified that your maintenance site, tools, protective equipment and operation procedures are in compliance with the insulation requirement.

Eyes should be protected with proper safety glasses, goggles or masks in operations such as hammering, drilling, polishing or prying or working around high-pressure air or liquid tanks, springs or other energy storage components. Eye protection devices should be worn as long as there are suspicious conditions.

Other protection devices such as gloves or safety shoes are used where necessary. Gloves should be worn before handling of a hot or sharp component that may cause serious burns or cuts or grasping of any things that may cause injuries.

Measures should be taken to protect you and others once a scooter is lifted. Make sure that the scooter is always supported stably when being lifted with a crane or jacks. Please use jack mounts.

The hot motor after driving for a long time may cause burns. Wait for the motor to cool down before working on it.

Moving parts can cause injuries. Make sure that your hands, fingers and clothes are not obstructive.

Components must be cleaned with non-flammable solvents instead of the gasoline.

All components related to a storage battery should be away from cigarettes, sparks and flames.

Contents

Contents	- 1 -
Foreword	- 2 -
General Information	- 3 -
Scooter body/scooter body panel	- 9 -
Maintenance	- 17 -
Front wheel/front suspension	- 23 -
Rear wheel/rear suspension	- 31 -
Braking system	- 36 -
Lithium battery/charger	- 47 -
Motor/controller/accelerator handle (Hall cable sensor)	- 56 -
Lighting/instrument/switch	- 67 -
Failure code diagnosis	- 92 -
Circuit diagram	- 97 -

Foreword

Key points in maintenance of Niu N1S are described in this maintenance manual.

Preparations in the maintenance manual include notes to all operations. Please read the manual carefully before operating.

Key points in the inspection and adjustment, including maintenance methods for scooter safety and component performance that are applied from regular examinations, are described.

Chapters are edited with disassembly diagrams, system figures and instructions about the maintenance and failure diagnosis.

Note:

Modifications of scooter version or structure as well as photos, pictures or instructions in the manual are referred to physical objects without further notice.

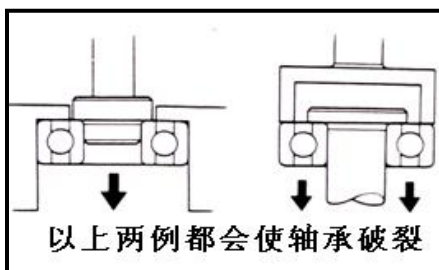
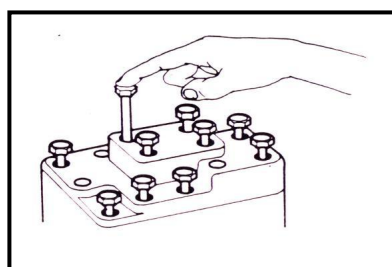
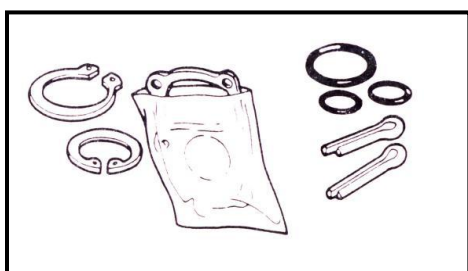
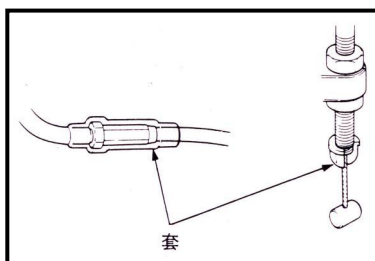
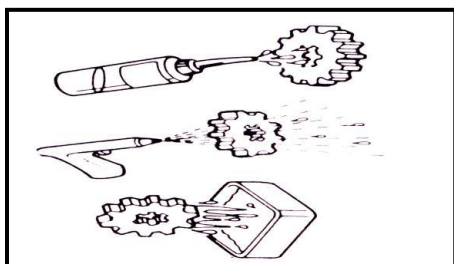
Jiangsu Niu Electric Technology Co. Ltd

General Information

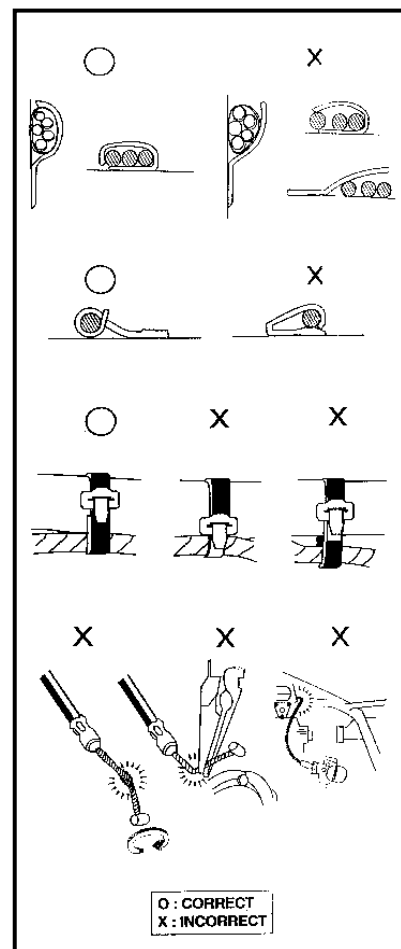
Maintenance Rules	- 4 -
Scooter Identification	- 6 -
Overall specifications	- 7 -
Specifications of the motor controller system	- 7 -
Specifications of the battery/charger	- 7 -
Specifications of the braking system	- 8 -
Specifications of the lighting/instrument/switch	- 8 -

Maintenance Rules

1. Metric tools should be made as available as possible in the maintenance of the scooter. Use of improper tools may damage the scooter.
2. Clean off the dirt outside parts or assemblies of the chassis or braking system before guard removal from the scooter or opening for maintenance.
3. Please clean parts and blow them with an air compressor after removal and before measurement of the wearing value.
4. Rubber parts that have become aged or deteriorated are very easy to be damaged by the solvent or oil. They should be checked or replaced if necessary before reassembly.
5. Multiple assemblies should be loosened in the sequence from outside to inside and beginning with small ones.
6. Complex assemblies should be stored in a proper installation sequence for further assembling.
7. Extra attention should be paid to important fitting positions before disassembling. Parts that are no longer to be used should be replaced before disassembly.
8. The bolt or screw length varies with assemblies and guards. Bolts or screws must be installed at correct positions. A bolt can be placed into a bolt hole for fitness in case of confusion
9. The oil seal should be installed by lubricant application into the oil seal groove, and should be checked for smoothness, smoothness and damages before installation.
10. The spherical bearings (on the front wheel-hub or rear wheel motor) should be removed by holding one or two bearing races (the inner and outer races) with tools. The bearing may be damaged in removal if the force is applied only to one race (the inner or outer race) and thus must be replaced.



The bearing can be broken in the following two cases



Cable connector inspection

Loose cables constitute a risk to electric safety. Cables should be checked after their clamping to ensure electric safety.

Bending of cable clamps towards welding points is not allowed.

Cables are bound at designated positions.

Cable placement at the scooter frame end or a sharp angle is not allowed.

Cable placement at the bolt or screw end is not allowed.

Cable placement should be made away from thermal sources or positions where cables may be stuck in moving.

The cable placement along stem handles should not be made too tight or loose and should not interfere with adjacent parts at any steering positions.

Cables should be placed smoothly without being twisted or tied.

Verify whether the connector shroud is damaged or the connector is excessively open before connecting.

Please protect the cable at a sharp angle or turning position with adhesive tapes or a hose.

Cables should be bound reliably with adhesive tapes after reparation.

Controlling cables should not be bent or twisted. The controlling would not be flexible if controlling cables were damaged.

Scooter Identification

The scooter frame identification code is made on the rear frame at rear seat cask.

The frame nameplate is riveted above the dual supports at right side of the frame.

The anti-altering is at inner right side of the seat cask.

The motor code is made at left side of the wheel-hub motor.

Important notes

1. Please use original parts made by Niu. Use of components that are not in compliance with design specifications by Niu Company may cause damages to the scooter.
2. Maintenance operations can be performed only with metric tools. The metric bolts, nuts and screws can not be interchanged with British fasteners.
3. The replacement with new washers, O rings, split pins and lock shims should be made for reassembly.
4. Bolts or nuts should be tightened by beginning with large-diameter bolts or inward bolts and then gradually tightening to specified torques diagonally, unless otherwise indicated.
5. Clean components that have been removed with the detergent solution. All the sliding faces should be lubricated before assembling.
6. Check all components for the proper installation and operating after assembly.
7. Remove the dirt and oil stains before measurement. Apply recommended lubricants to sections to be lubricated during assembly.
8. Apply the lubricant to part surfaces to avoid rusting and dust accumulation, if the engine and transmission systems need to be stored for a long time after disassembling.

Overall specifications

Item		Specifications
Dimensions	Length × width × height	1800×700×1130 mm
	Wheelbase	1280mm
	Complete vehicle kerb mass	90Kg
	Ground clearance of the seat cushion	740mm
	Ground clearance	140mm
Scooter frame	Type of the scooter frame	The pedal type made with combined welding of panels and pipes
	Specifications of the front tire	90/90-12
	Type of the front rim	2.15X12 aluminum alloy rim
	Air pressure of the front tire	175KPa
	Specification of the rear tire	120/70-12
	Type of the rear rim	3.50X12 rim motor
	Air pressure of the rear tire	250KPa
Suspension	Front shock absorber	Telescopic type with 31mm dual hydraulics
	Rear shock absorber	Telescopic type with dual hydraulic springs
Brake	Type of the front brake	Hydraulic brake with dual pistons at one side
	Type of the rear brake	

Specifications of the motor controller system

Item		Specifications	
Motor	Motor type	Brushless permanent-magnet motor	
	Control method	FOC vector control	
	Rated voltage	DC60V	
	Rated power	1200W	1500W
	Maximum motor power	2000W	2400W
	Maximum motor torque	110N*m	120N*m
Controller	Rated voltage	DC60V	
	Undervoltage protection	52±1V	
	Maximum current of the controller	35A	40A

Specifications of the battery/charger

Item		Specifications
Battery	Type	Enclosed lithium battery
	Rated voltage	60V
	Rated capacity	20Ah-30Ah
Charger	Rated output voltage	69.7V
	Rated output current	3-4A

Specifications of the braking system

Item	Standard value (mm)	Usability limit(mm)
Diameter of the front brake disc	φ220mm	-
Thickness of the front brake disc	4.0	3.0
Thickness of the front hydraulic brake pad	4.0	3.0
Dedicated brake liquid	DOT3 or DOT4	
Diameter of the rear brake disc	φ180mm	-
Thickness of the rear brake disc	3.5	2.5
Thickness of the rear hydraulic brake pad	4.5	3.0
Dedicated brake liquid	DOT3 or DOT4	

Specifications of the lighting/instrument/switch

Electric system	
Item	Specifications
Front headlight	12V LED
Turn signal lamp	12V LED
Rear tail lamp	12V LED
Brake lamp	12V LED
Instrument	12V LCD instrument panel
Central control unit	12V
USB charging interface	

Scooter body/scooter body panel

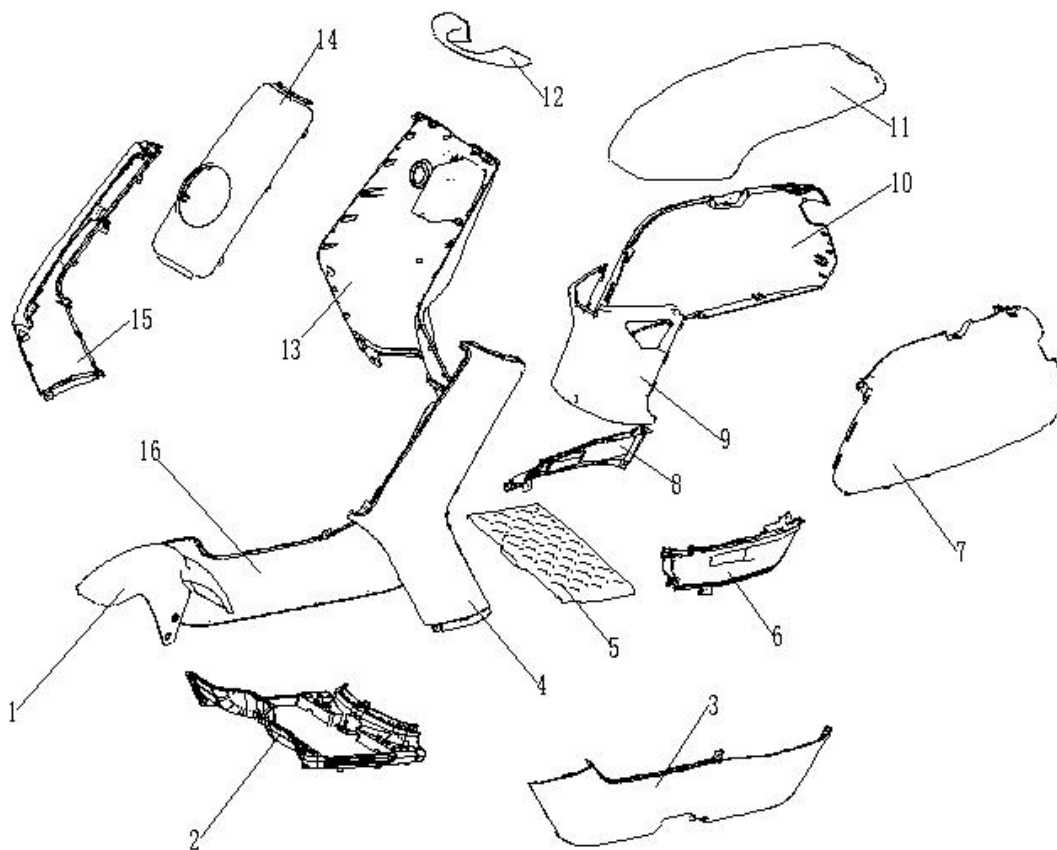
Position of the scooter body panel



- (1) Windshield (2) Front journal lid (3) Front panel (4) Front fender bushing (5) Side panel
(6) Side strip (7) Rear bottom fork (8) Rear fender (9) scooter body cover (10) Rear Handrail
(11) Saddle (12) Front glove compartment (13) Central guard (14) Battery compartment cover
(15) Pedal

*** Note**

Do not damage scooter body coverages in disassembling/assembling.
Do not damage hooks and claws on scooter body coverages in disassembling/assembling.
Align the embedded panels and covers on scooter coverages with their respective grooves.
Hooks and claws at various sections should be installed properly during assembly.
Do not damage components of a covering part when it is being installed.



1. Front Fender 2. Pedal 3. Left side strip 4. Left front panel 5. Battery pedal 6. Left foot guard
7. Left scooter body 8. Right foot guard 9. Central guard 10. Right scooter body 11. Seat cushion
12. Front journal lid 13. Glove compartment 14. Panel 15. Right front panel 16. Right side strip

scooter body coverage

Remove the scooter body in the following sequence

Battery pedal→Foot pedal→Left side strip/right side strip→Front journal lid→Panel→Left front panel/right front panel

Seat cushion→Central guard→Seat cushion assembly→Left foot guard/right foot guard→Left scooter body/right scooter body

* **Note**

Do not damage scooter body coverages in disassembling/assembling.

Do not damage hooks and claws on scooter body coverages in disassembling/assembling.

Align the embedded panels and covers on scooter coverages with their respective grooves.

Hooks and claws at various sections should be installed properly during assembly.

Maintenance Information

Overview

Procedures for removal and installation of scooter body panels are described in this section.

The ignition switch and air switch must be turned to OFF before disconnection or connection of electric units, when the storage battery has been installed onto the scooter.

Windshield

Removal/installation

Remove 3 bolts with washers, and then remove the windshield.

Perform the installing contrary to the removal sequence.



Front journal lid

Removal/installation

Remove 2 screws, and then remove the front journal lid.

Perform the installing contrary to the removal sequence.

Front panel

Removal/installation

Remove 2 screws on the top and
2 expansion screws on the bottom.

Lift up and remove the front panel.

Perform the installing contrary to the removal sequence.



Saddle/storage box

Removal/installation

Open the saddle.

Remove 4 screws from the storage box.

Perform the installing contrary to the removal sequence.



Charger socket

Removal/installation

Remove the storage box.

Disconnect the white connector with charger socket.

Remove 2 installation screws.

Take the charger socket out of the installation hole.



Central guard

Removal/installation

Remove 3 installation screws.

Remove hooks and lugs of the central guard from the left and right scooter body covers and foot pedal, and then remove the central guard.



scooter body cover/tail lamp assembly

Removal/installation

Remove the following components:

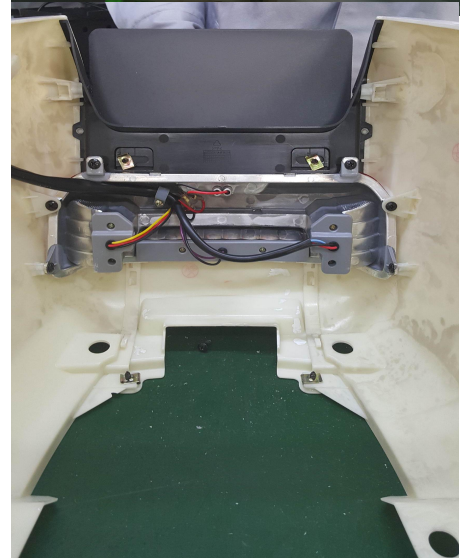
Storage box

Rear handrail

Central guard

Disconnect the saddle lock cable from the saddle switch assembly.

Disconnect the tail lamp cable connector.



Tail lamp assembly

Remove 6 installation screws, and then remove the tail lamp assembly from the scooter body guard.

Removal/installation

Open the battery compartment cover with the storage box key.

Remove 4 connection screws from the battery compartment.

Remove the battery compartment cover.

Perform the installing contrary to the removal sequence.



Foot pedal

Removal/installation

Remove 4 connection bolts from the foot pedal.

Remove the battery compartment cover.

Side strip

Removal/installation

- Remove the battery cover.

- Remove the foot pedal.

Slide the right side strip slightly towards the rear, and then remove hooks.

Remove the right side strip.

Perform the installing contrary to the removal sequence.

Removal/installation of the left side strip

Same as steps for removal/installation of the right side strip.

Side panel

Removal/installation

- Remove the front panel.

- Remove the battery compartment cover.

- Remove the central guard

- Remove the foot pedal.

- Remove the left and right side strips.

Remove connection screws.

Lift up the right side panel slightly, and remove hooks.

Remove the right side panel.

Perform the installing contrary to the removal sequence.

Removal/installation of the left side panel

Same as steps for removal/installation of the right side panel.

Front glove compartment

Removal/installation

- Remove the battery cover.

- Remove the central guard

- Remove the foot pedal.

- Remove the left and right side strips.

- Remove the left and right side panels.

Remove connection screws.

Remove the lock cover.

Remove the front glove compartment.

The installation steps are contrary.



Rear fender

Removal/installation

Support at one side

Remove 2 connection bolts at one side.

Remove the rear fender.

Front fender bushing

Removal/installation

Remove 4 left and right connection bolts.

Remove the front fender bushing.

The installation sequence is contrary to the removal.



Maintenance

Maintenance.....

Maintenance Information.....

Operation of the accelerator handle.....

Wearing of the brake plate (with the disc brake type).....

Inspection of the brake handle.....

Brake liquid.....

Brake lamp switch.....

Inspection of the scooter lamp system and switches.....

Side support.....

Suspension system.....

Nuts, bolts and fasteners.....

Wheels/tires.....

Steering column bearing.....

Maintenance Maintenance Information

OverviewThe scooter is set on a flat ground before operating. The scooter is inspected, tested, cleaned, adjusted, lubricated or replaced (if necessary) as per items and maintenance cycles specified in the maintenance schedule. The following items require a certain degree of the mechanical knowledge. Some items may require more technical data and tools.

Category	Inspection item	Inspection result
Appearance inspection	Whether there are modifications	
	Appearance of plastic scooter parts	
	Screws and fasteners	
	Front and rear shock absorbers	
	Gap and deformation	
Fixed assembling	Lock and hook assembling	
	Steering inspection	
	Front and rear tires	
	Front wheel and wheel-hub assembly	
	Inspection of the front and rear axles for tightening	
	Single/dual supports	
	Handrail	
	Left and right handles	
Braking system	Brake liquid volume	
	Assembly clearance	
	Abnormal brake noise	
	Response time	
	Braking distance	
	Appearance inspection	
Electric performance	Power lock	
	Lighting inspection	
	Instrument inspection	
	scooter insulation	
	Alarm and horn	
	EBS energy recovery	
	Controller inspection	
Wheel-hub motor	Wire connection and appearance	
	Inspection for abnormal noise	
	Startup inspection	

	Tolerance and deformation	
--	---------------------------	--

Operation of the accelerator handle

Check the accelerator handle for smooth operating.

Check the accelerator handle for smooth opening and automatic resetting at all steering positions of the steering handle.

Check the accelerator handle cable if the accelerator handle can not be reset as usual.

Wearing of the brake plate (with the disc brake type)

Check the brake plate for wearing.

The brake pad of a brake plate that has been worn to the extent indicated by the wearing limit indication groove should be replaced.

The brake pads should be replaced in pair to ensure uniform pressure on the brake plate.

Inspection of the brake handle

Check connection of the brake handle for looseness. Check the brake handle for excessive free travel or other damages.

Perform replacement or reparation if necessary.

Brake liquid

Note:

The leaking brake liquid can damage coatings, plastics or rubber parts. They should be well covered with cloths or paper sheets during the system maintenance.

Do not use different types of the brake liquid because they are not compatible with each other.

Do not let foreign matters enter into the braking system in filling the liquid reservoir with the brake liquid.

Check the brake plate for wearing when the brake liquid level is too low.

A low level of the brake liquid may result from wearing of the brake plate that causes push-out of the brake caliper piston. Check the entire system for leakage if a low level of the brake liquid occurs without wearing of the brake plate.

Lift up the scooter with the kickstand.

Turn the steering handle reversely to

make the liquid reservoir horizontal, and

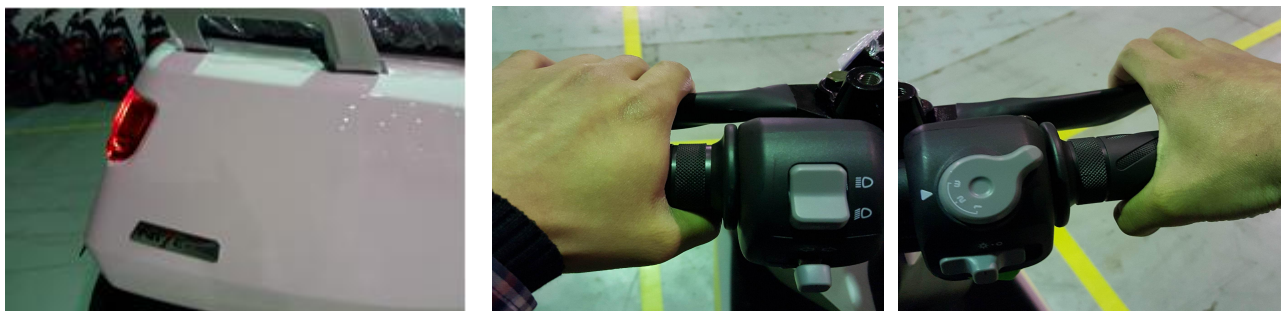
check the brake liquid level in the front brake liquid reservoir through the glass observation hole.

Check the brake plate for wearing if

the brake liquid level is around the lower-limit horizontal scale.

Brake lamp switch

The brake switch on the brake handle can not be adjusted.



Front brake

Make sure that the brake lamp turns on in actual application of the brake.

Replace the front brake switch or other faulty components in the braking system, if turn-on of the front brake switch is not synchronous with brake application.

Rear brake

Make sure that the brake lamp turns on in actual application of the brake.

Replace the rear brake switch or other faulty components in the braking system, if turn-on of the rear brake switch is not synchronous with brake application.

Inspection of the scooter lamp system and switches

Turn on the ignition switch to check left and right combination switches.

Make sure that the corresponding light to actual switch application turns on.

Make sure that the light brightness and flashing are normal,
the horn sounding is normal,

the startup key operates normally,

The speed regulation switch operates normally, and
the switching between high and low beams is normal.

Side support

Lift up the scooter with the kickstand.

Check the side support spring for damages or tension loss.

Check the side support assembly for free movement.

Lubricate the side support pivot where necessary.

Suspension system

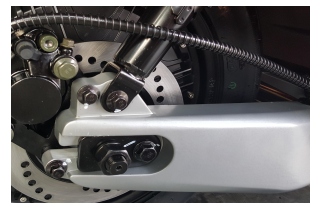
Front suspension

Operate the front brake and press the front suspension system for several times to check motion of the fork.

Check the entire assembly for leakage, damages or loosened fasteners.

Replace damaged components that can not be repaired.

Tighten all the nuts and bolts.



Rear suspension

Press the rear shock absorber for several times to check its motion.

Check the entire shock absorber assembly for leakage, damages or loosened fasteners.

Replace damaged components that can not be repaired.

Tighten all the nuts and bolts.

Lift up the scooter with the kickstand.

Grasp both sides of the rear rocker and try to move it leftward and rightward.

Check the rear rocker for looseness.

Nuts, bolts and fasteners

Make sure that all nuts and bolts on the chassis have been tightened as per correct torque values.

Make sure that all the split pins, safety clips, hose clamps and wire cables have been placed properly and secured tightly.

Inspection and maintenance of fasteners

Schedule of fastener torque values

Tightened section and fastener name	Tightening torque (N·m)
Installation screws on the front hydraulic brake plate	
Tightening bolts on the front shock absorber	5-9 N·m
Tightening bolts on the fixed handle seat cover	18-28 N·m
Tightening bolts on the welded steering handle assembly	5-9 N·m
Front axle	40-60 N·m
Installation screws on the rear hydraulic brake plate	5-9 N·m
Self-locking nuts on the motor	60-80 N·m
Top bolts on the rear shock absorber	37-44 N·m
Bottom bolts on the rear shock absorber	22-29 N·m
Tightening screws on the hex flange of rear handrail	22-29 N·m
Tightening nuts on the fixed shaft of rear bottom fork	55-62 N·m

Wheels/tires

Support the scooter with the main kickstand.

Make sure that the fork is unable to move, and then lift up the front wheel to check range of the free travel.

Grasp the front wheel and try to move it leftward and rightward to check the front wheel bearing for wearing.

Replace the front wheel bearing if it becomes loosened.

Turn the wheel to make sure that it can be rotated smoothly without an abnormal noise.

The front wheel bearing should be inspected as long as there are suspicious abnormal conditions.

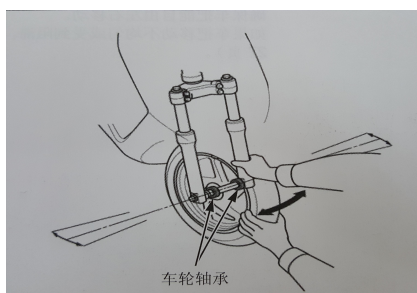
Support the scooter, and then lift up the rear wheel.

Grasp the rear wheel and try to move it leftward and rightward to check the rear wheel bearing for wearing.

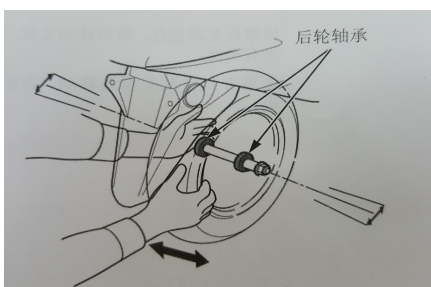
Replace the rear wheel bearing if it becomes loosened.

Turn the wheel to make sure that it can be rotated smoothly without an abnormal noise.

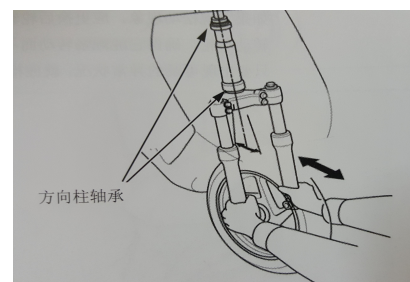
The rear wheel bearing should be inspected as long as there are suspicious abnormal conditions.



Wheel bearing



Rear wheel bearing



Steering column bearing

Check the tire pressure with the tire pressure gauge when the tire has been cooled down.

Recommended tire pressure:

20-25psi

Front tire: 20-25psi

26-32psi

Rear tire: 26-32psi

Check the tire for cuts, embedded nails or other damages.

Check central flatness of the front and rear wheels.

Check the tread depth.

Steering column bearing

Support the scooter with the kickstand, and lift up the front wheel to make it off the ground.

Make sure that scooter handles can be turned freely to left and right sides.

Check the steering column bearing, if scooter handles are not moving smoothly or are stuck.

Fix the scooter and move the fork forth and back to check the steering column bearing for wearing.

Check the steering column bearing if the steering column is displaced vertically.

Front wheel/front suspension

Preparation

Failure diagnosis

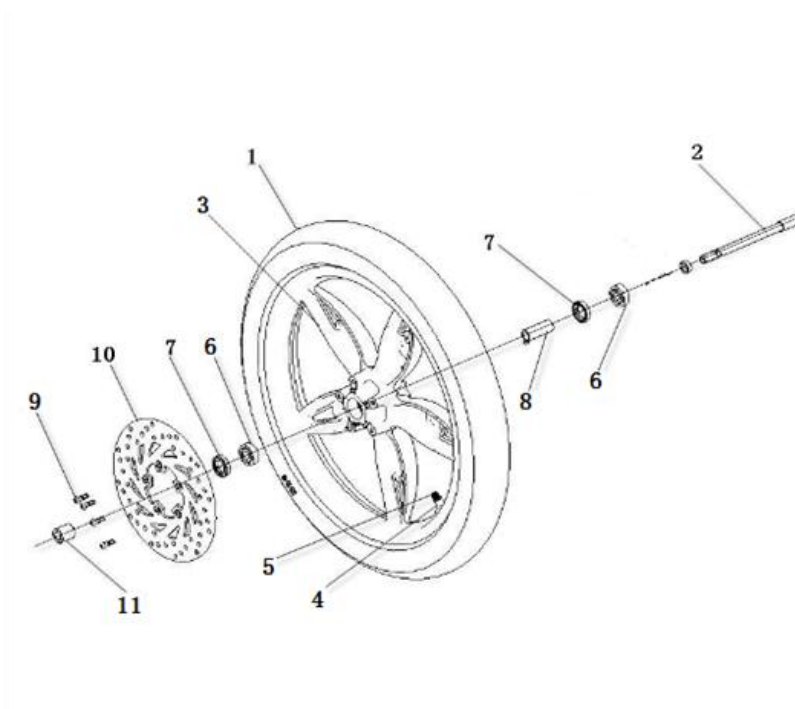
Front wheel

Steering handle

Front fork

Front wheel/front suspension

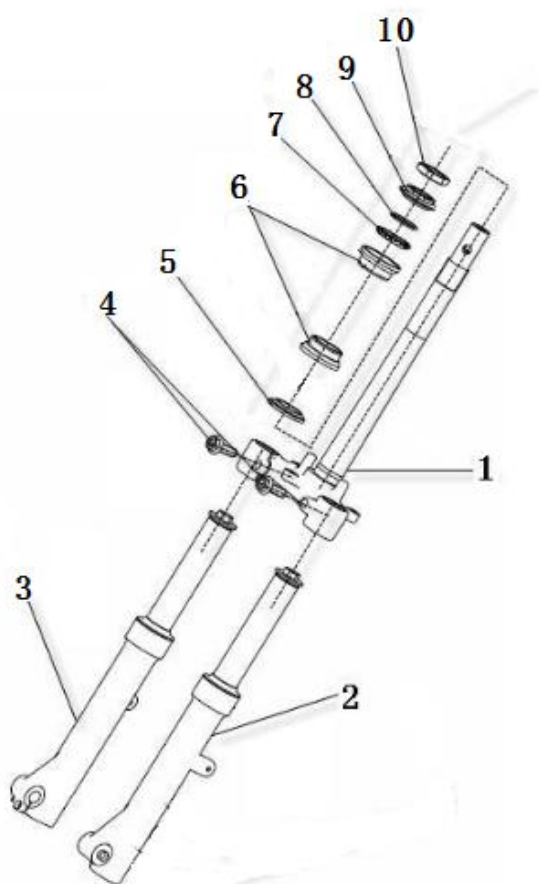
A	Specifications of the front tire: Outer tube 90/90-12
B	5-9 N·m Installation torque value for screw 11 in the figure: 5-9 N·m
C	Rim run-out limits: 2.0mm Vertical limit: 2.0mm 2.0mm Lateral limit: 2.0mm
D	Deflection limit of the front axle: 0.2mm 0.2mm



1. Vacuum tire 90/90-12 2. Front axle 3. Front rim 12×1.25 4. Inflating valve 5. Inflating valve cap
6. Front wheel oil-seal 7. Bearing 8. Intermediate spacer on the front wheel 9. Screw M6×20 10.
Front brake disc 11. Outer spacer on the front wheel

Front fork

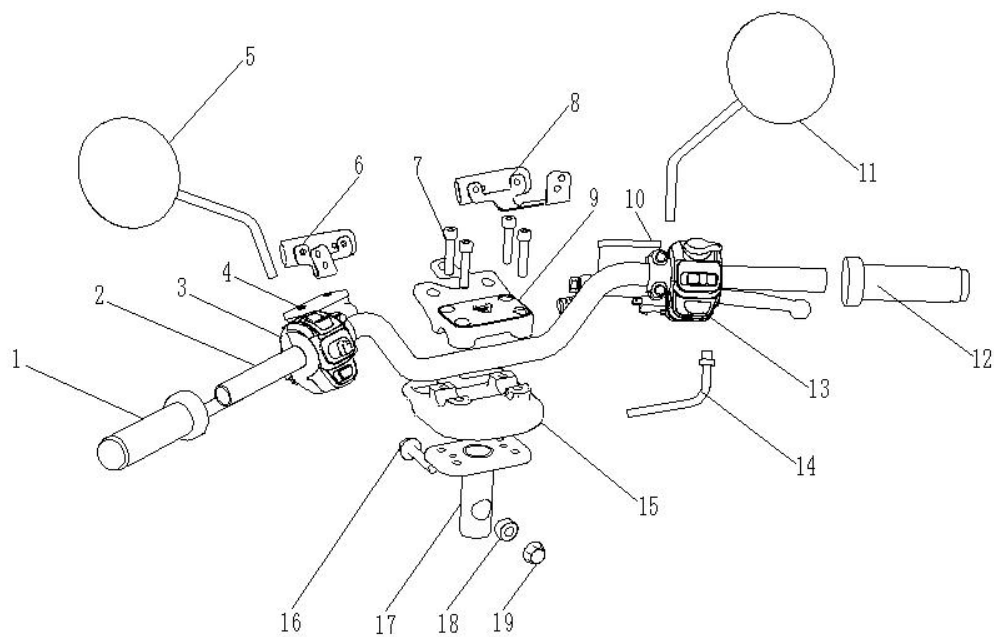
A	: 18-28 N·m Installation torque value for bolt 4 in the figure: 18-28 N·m
B	Upper conical bearing: 32005
	Lower conical bearing: 32006



1. Welded lower yoke plate assembly 2. Front left shock absorber assembly 3. Front right shock absorber assembly 4. Bolt M10×1.25 5. Lower conical bearing 6. Outer race of the upper conical bearing 7. Upper conical bearing 8. Bearing cover 9. Lock nut 10. Gland nut

Steering handle

A	Installation torque value for bolt 16 (as a tightening bolt on the steering handle) in the figure: 40-60 N·m 40-60 N·m
B	Free travel of the front brake handle: 7-15mm 7-15mm
C	Free travel of the rear brake handle: 7-15mm 7-15mm
D	Free travel of the accelerator control handle 12: 5-10mm



1. Left handle glove 2. Steering handle assembly 3. Left combination switch 4. Rear brake 5. Left rear-view mirror 6. Left turn signal lamp 7. Hex socket bolt M10 8. Right turn signal lamp 9. Upper press block on the scooter handle 10. Front brake 11. Right rear-view mirror 12. Accelerator control handle 13. Right combination switch 14. Accelerator cable 15. Grip end collar 16. Hex flange bolt M10 17. T-shape board 18. Fixed block 19. Nut M10

Front wheel/front suspension

Preparation

Failure diagnosis

Front wheel

Steering handle

Front fork

Preparation

Operation notes

Support the scooter body bottom with jacks before removal of the front wheel. The front wheel should not be turned reversely when it is in touch with the ground.

There should be no grease that adheres to brake shoes, brake shoe assemblies and brake discs in operating.

scooter reference

Measurement position	Item		Standard value (mm)	Usability limit (mm)
Front wheel axle	Deflection			0.2
Front wheel	Rim oscillation	Vertical		2.0
		Lateral	Within 1.0	2.0

Torque value

Tool

Tightening bolts on the steering handle assembly rod

40-60 N•m

Bearing removal

Front axle

55-62 N•m

Tightening nut spanner

Tightening bolts on the front shock absorber

18-28 N•m

Failure diagnosis

The steering handle is difficult to turn.

The steering handle bearing failed.

The steering handle bearing is damaged.

The tire pressure is too low.

There is air leakage from the tire.

Steering is unstable.

The steering handle bearing is damaged.

The tire pressure is insufficient.

The front fork and front axle are deflected.

- The front wheel tire is deformed and the tire is deflected.
- The front wheel oscillates.
- The rim is deformed.
- The front axle bearing becomes loosened.
- The tire is deteriorated.
- The wheel is difficult to turn.
- The axle bearing failed or the braking is bad.
- The front axle is deflected.
- The front brake is applied.
- There is an abnormal noise from the front shock absorber.
- Bolts on the shock absorber are loosened.
- The liquid in the front shock absorber is insufficient.
- The guide sleeve on the front shock absorber bottom-cylinder is worn.

Front wheel

Disassembling:

Note:

The electric scooter must be supported firmly.

Loosen the installation bolt ④ on the brake cylinder assembly.

Remove the brake cylinder assembly

Place an appropriate support under the lower water-baffle in order to lift up the front wheel.

Loosen the front axle ① to remove the front wheel assembly.

Remove the front brake disc ②.

Remove the front wheel oil-seal, outer spacer on the front wheel, bearing and intermediate spacer on the front wheel.

Inspection of the axle deflection

Place the axle on a V-shape seat and measure its eccentricity with a micrometer gauge.

Inspection

Usability limit: replace it for more than 0.2mm

Inspection of the rim oscillation

Place the rim on a precise support.

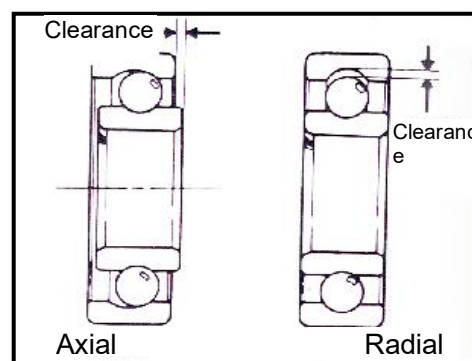
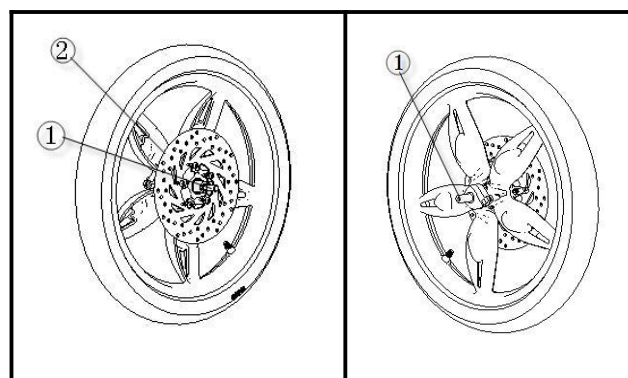
Check the rim oscillation.

Manually turn the wheel to read the oscillation value.

Usability limit:

Vertical direction: replace it if above 2.0mm

Lateral direction: replace it if above 2.0mm Inspection of the



front wheel bearing

Remove the front axle and front brake disc.

Remove outer spacer on the front wheel, and then remove the front wheel oil-seal.

Remove the bearing.

Remove the intermediate spacer.

Check the bearing rotation.

The bearing that does not rotate is worn or loosened. Replace it with a new one.

Bearing replacement

Remove the front axle, front wheel brake disc and outer spacer on the front wheel.

Remove intermediate spacer of the front wheel, and then

remove the oil seal and bearing respectively with the oil seal detacher and bearing detacher.

Note: The bearing that has been removed should be replaced with a new bearing.

Apply the lubrication grease to the bearing in installing, and then

insert the bearing with a bearing installation tool.

* Note

•The bearing must be inserted in parallel.

Installation

The installing is made contrary to removal steps. Pay attention to the following items:

Lubricate the front axle, oil seal (lip), bearing, intermediate shaft spacer on the front wheel, and outer spacer on the front wheel.

A recommended lubricant is the calcium-base lubrication grease.

Install the front wheel and front axle.

Install the brake cylinder assembly onto the front rim.

Tighten the front axle.

Torque value

Front axle 55-62 N•m

Steering handle

Disassembling:

Remove the left and right rear-view mirror assemblies (5) and (11).

Remove the left and right grasp handle assemblies (1) and (12).

Remove the accelerator cable assembly (14).

Remove the left and right combination switched (3) and (13).

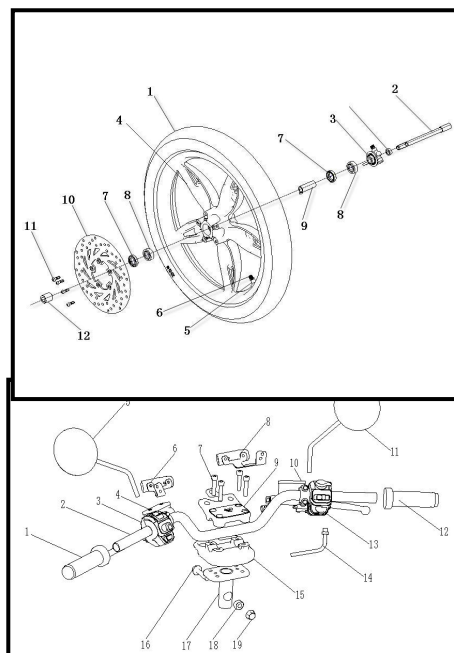
Remove the rear brake (4).

Remove the front brake (10).

Remove upper and lower press blocks (9) and (15) on the scooter handle.

Installation

The installing is made contrary to the removal sequence.



Tightening bolts on the steering handle assembly

Torque value: 40-60 N·m

Front fork

Disassembling:

Remove the panel, front journal lid and front fender.

Remove the steering handle assembly.

Sequentially remove:

Gland nut, lock nut, bearing cover and upper conical bearing

Remove the front fork.

Remove the lower conical bearing.

Remove tightening bolts from the front shock absorber.

Remove the front left and right shock absorber assemblies.

Tools:

Spanner for tightening bolts on the steering handle.

Dedicated bearing detacher.

Installation

Apply the lubrication grease to the lower conical bearing, and make sure that the bearing rotates freely.

Then install the steering column.

Support the steering handle. Apply the lubrication grease to the upper conical bearing.

Make sure that it rotates freely.

Rotate the steering handle leftward and rightward to make the bearing be in tight contact with outer race of the bearing.

Tools:

Tightening nut spanner.

Rotate the front fork leftward and rightward to make sure that its rotation is smooth without looseness.

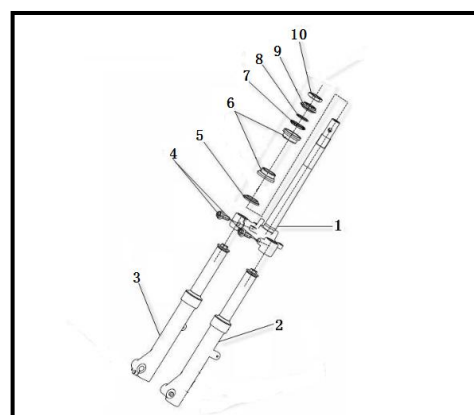
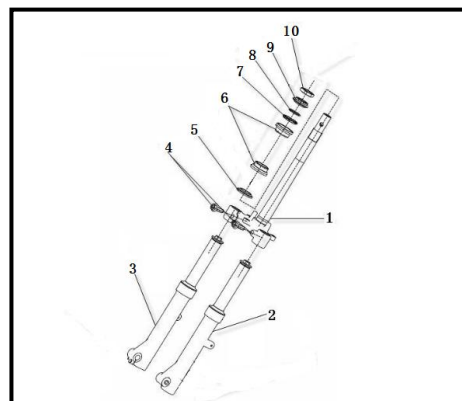
Steps:

Install the front shock absorber assembly.

Install the steering handle assembly, front panel, front journal lid, front wheel and front fender.

Torque value for

tightening bolts on the front shock absorber assembly: 37-44 N·m



Rear wheel/rear suspension

Preparation

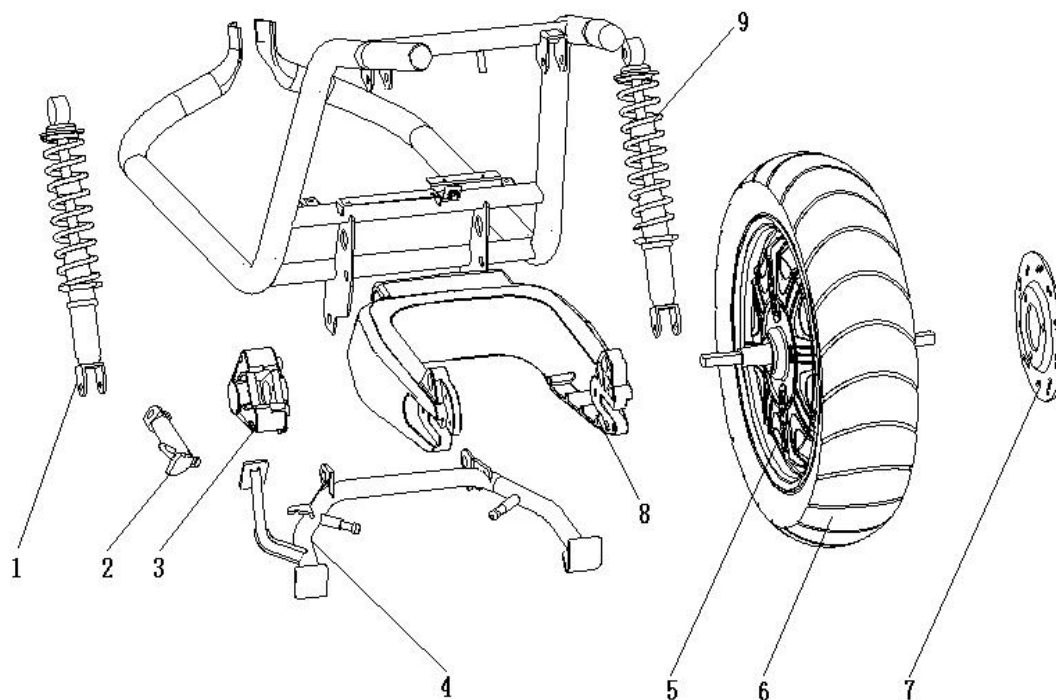
Failure diagnosis

Motor

Rear shock absorber

Rear wheel/rear suspension

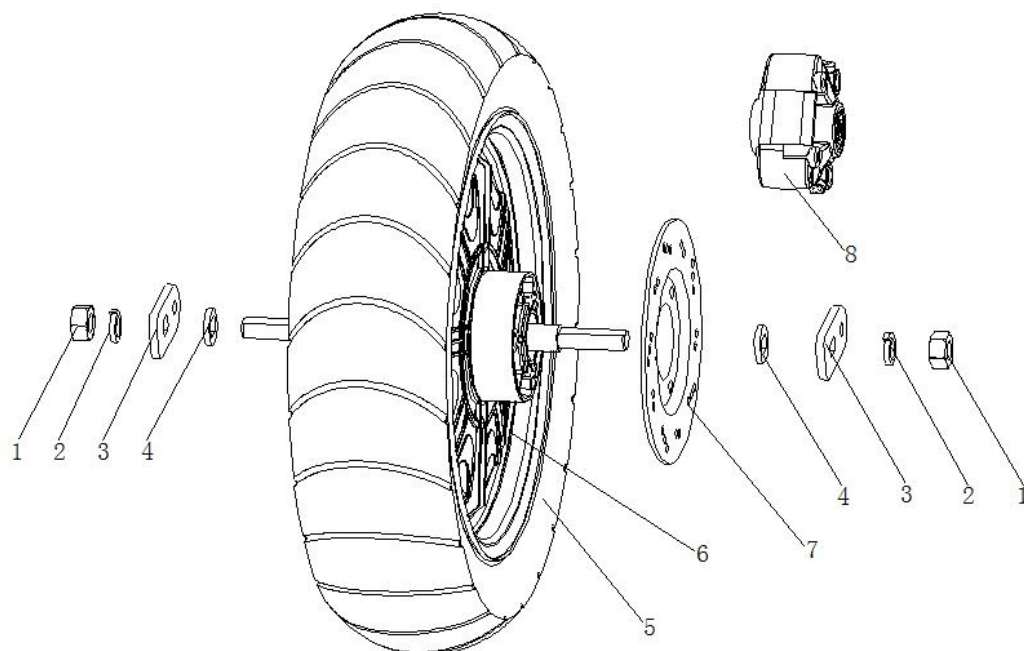
A	Torque value for self-locking nuts on the motor as shown in the figure: 60-80 N•m
B	Diameter of the brake disc: $\phi 180\text{mm}$
C	Thickness of the brake disc: 3.5mm Wearing limit: 3.0mm



1. Left rear shock absorber 2. Side support 3. Rear brake 4. Kickstand 5. Motor 6. Vacuum tire 7. Rear brake disc 8. Rear bottom fork 9. Right rear shock absorber

Motor

A	Tire size: 120/90-12
B	Motor run-out limits:
	Vertical: 2.0mm Lateral: 2.0mm
C	Lock nuts on the motor: 60-80 N•m



1. Lock nut 2. Spring washer 3. Lock washer 4. Limit washer 5. Vacuum tire 120/90-12 6. Motor 7. Rear brake disc 8. Rear disc brake pump

Rear wheel/rear suspension

Preparation

Failure diagnosis

Rear wheel

Rear shock absorber

Preparation

Operation notes

There should be no oil stains on the brake disc.

Generally the rear wheel and suspension are supported with a safety support or a safety crane during their maintenance.

Please use original components made by Niu to replace bolts and nuts on the suspension pivot and also at the installation position.

Preparation reference

Item		Standard value (mm)	Usability limit (mm)
Motor oscillation	Vertical		2.0
	Lateral		2.0

Tightening torque

Self-locking nuts on the motor **60-80 N•m**

Top bolts on the rear shock absorber **37 - 44 N•m**

Bottom bolts on the rear shock absorber **22 - 29 N•m**

Failure diagnosis

Oscillation of the rear wheel

Deformation of the motor rim

Motor failure

Motor un-tightned

Bearing loosened or worn

Insufficient tyre pressure

Shock absorber softened excessively

Insufficient spring elasticity

Oil leakage from shock absorber

No elasticity of the rear shock absorber spring

Extremely low tyre pressure

Shock absorber hardened excessively

Shock absorber rod deflected

Extremely high tyre pressure

Abnormal noise from the rear suspension

Rear suspension liner thinned and softened

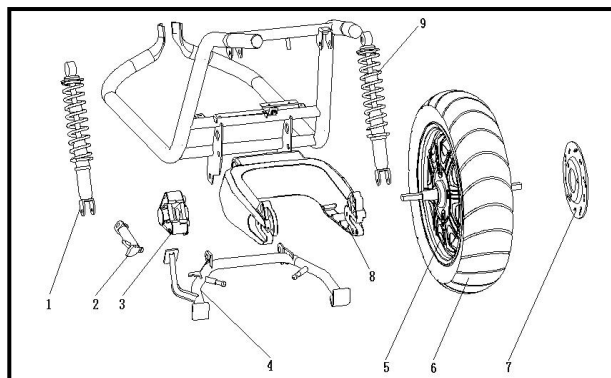
Failure of the rear shock absorber

Motor

Disassembling:

Remove lock nuts from the motor.

Remove motor connection wires.



Remove the motor assembly.

Remove the brake disc.

Inspection

Inspection of the motor oscillation

Manually turn the motor and measure its eccentricity with a micrometer gauge.

Usability limit:

Vertical direction: replace it if above 2.0mm

Lateral direction: replace it if above 2.0mm

Installation

Install the rear wheel and tighten nuts in the sequence contrary to removal.

Self-locking nuts on the motor

Torque value: 60-80 N·m

Rear shock absorber

Disassembling:

Remove the seat cushion assembly and the scooter body assembly.

Loosen tightening bolts on top of the rear shock absorber.

Loosen tightening bolts on bottom of the rear shock absorber.

Remove the rear shock absorber.

Installation

Install the rear shock absorber.

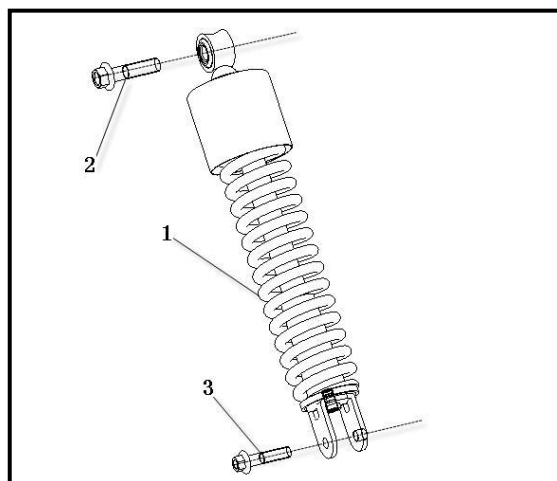
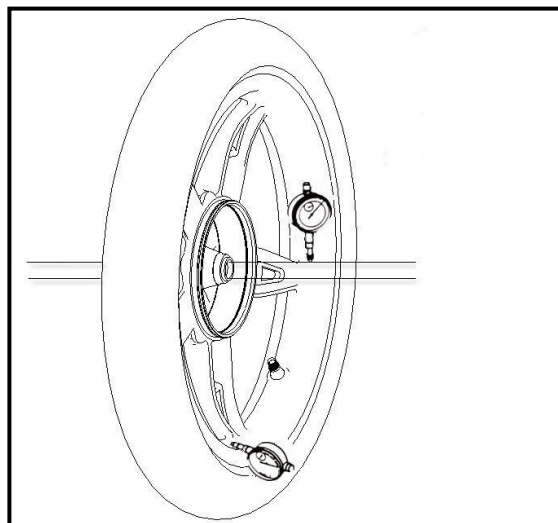
Torque value for the rear shock absorber:

Tightening bolts on top: 37-44 N·m

Tightening bolts on bottom: 22-29 N·m

Installation of the rear shock absorber

Install the rear shock absorber and tighten nuts in the sequence contrary to removal.



Braking system

Maintenance instruction

Failure diagnosis

Front hydraulic brake

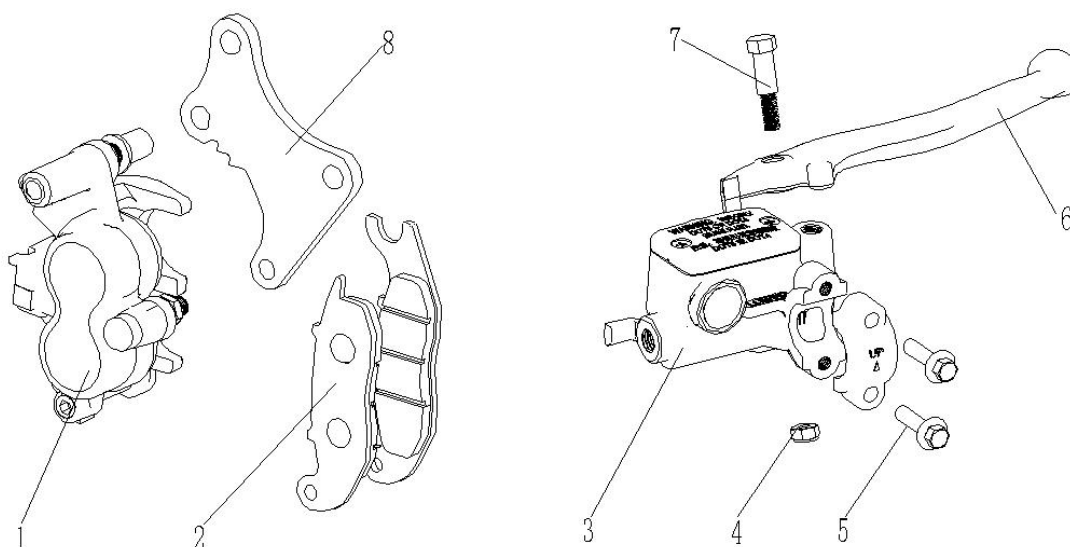
Rear hydraulic brake

Adjustment of the rear brake pad

Brake liquid change/air discharging

Front hydraulic brake

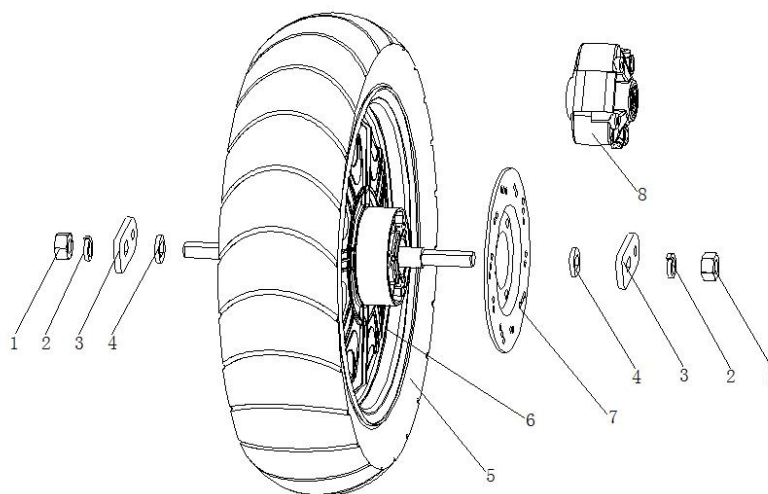
A	Diameter of the front brake disc: φ220mm φ220mm
B	Thickness of the front brake disc: 4.0mm Operating limit: 3.0
C	Installation torque value for bolt 5 in the figure: 5-9 N•m
D	Free travel of the brake handle: 7-15mm 7-15mm



1. Lower pump assembly on the front hydraulic brake
the front hydraulic brake
2. Brake pad
3. Upper pump assembly on
the front hydraulic brake
4. Nut M6
5. Bolt M6
6. Brake handle
7. Tightening bolts on the
handle
8. Installation board

Rear hydraulic brake

A	Diameter of the rear brake disc: φ180mm φ180mm
B	Thickness of the rear brake disc: 3.5mm Operating limit: 2.5
C	Free travel of the brake handle: 7-15mm 7-15mm



1. Self-locking nut 2. Spring washer 3. Lock washer 4. Locating washer 5. Vacuum tire
120/90-12 6. Motor 7. Brake disc 8. Rear disc brake pump

Brake

Maintenance instruction

Failure diagnosis

Front hydraulic brake

Rear hydraulic brake

Maintenance instruction

Operation notes

* Note

- There should be no oil stains on the brake assembly in installing or removal.
- The cleaning should be made with a specified detergent to avoid reduction of the brake performance.

Check the brake before riding*

Specifications

Item	Standard value (mm)	Usability limit (mm)
Diameter of the front brake disc	φ220mm	-
Thickness of the front brake disc	4.0	3.0
Thickness of the front hydraulic brake pad	4.0	3.0
Dedicated brake liquid	DOT3 or DOT4	
Diameter of the rear brake disc	φ180mm	-
Thickness of the rear brake disc	3.5	2.5
Thickness of the rear hydraulic brake pad	4.5	3.0
Dedicated brake liquid	DOT3 or DOT4	

Torque value

Installation screws on the front/rear hydraulic brake disc	5-9	N•m
Tightening bolts on the fixed handle seat cover	5-9	N•m
Self-locking nuts on the motor	60-80	N•m

Failure diagnosis

Brake

The brake performance is not good.

1. The brake is not adjusted properly.
2. The brake pad and brake disc are worn.
3. The brake assembly is not installed properly.
4. The brake pad and brake disc are contaminated.

The brake responds slowly or the handle is tight.

1. The brake is not adjusted properly.
2. The brake pad and brake disc are worn.
3. The brake assembly is not installed properly.

There is an abnormal noise from the brake.

1. The brake pad and brake disc are worn.

2. The brake pad and brake disc are contaminated.

The brake handle is softened without an effective application.

There is air in the hydraulic system.

There is leakage from the hydraulic system.

The brake pad is worn.

The brake caliper piston seal is worn.

The main cylinder piston cup is worn.

The brake pad is dirty.

The brake caliper is dirty.

The main cylinder is dirty.

The brake caliper does not slide smoothly.

The brake liquid level is low.

The flow channel is blocked.

The brake pad is bent and deformed.

Front hydraulic brake

Disassembling:

*** Note**

- Replace the brake pad assembly.
- If the brake pad assembly will be used again, than it should be marked at side before removal so that it can be installed at its original position.

Remove the following assemblies from the right handle and front shock absorber.

Front brake:

1. Oil pump body assembly
2. Front brake disc
3. Brake cylinder assembly
4. Brake pad assembly
5. Brake hose assembly
6. Hydraulic brake handle

*** Note**

- There should be no oil stains on the front hydraulic brake pad assembly in installing or removal.
- The cleaning should be made with a specified detergent to avoid reduction of the brake performance.

Loosen tightening bolts on the brake cylinder assembly.

Remove the brake cylinder assembly from the front shock absorber.

Remove the front axle, and remove the front wheel.

Remove the brake disc from the front wheel.

Inspection

Check the front hydraulic brake pad assembly for wearing.

Replace brake shoes where necessary.

Measure thickness of the front hydraulic brake pad assembly.

Measure thickness of the front brake disc, and record the maximum value.

Specifications

N1 Diameter of the front brake disc ϕ 220mm

Thickness of the front brake disc 4.0mm

Thickness of the front hydraulic brake pad 4.0mm

* Note

•The measurement should be made with a micrometer gauge.

Measure thickness of the front hydraulic brake pad assembly.

The brake disc and front hydraulic brake pad assembly should be replaced,

if their thickness is less than the maintenance value or they are contaminated with the grease.

Usability limit: Front hydraulic brake pad 3.0mm

Front brake disc 3.0mm

*Note:

The front hydraulic brake pad assembly should be replaced in pairs.

The brake disc can be measured when it stays on the scooter without removal.

Installation

Install the front brake disc and front wheel assembly.

Install the front hydraulic brake pad assembly.

Install the front brake hose assembly and brake cylinder assembly.

Install the oil pump body assembly and switch assembly.

Do not make the grease adhere to the front hydraulic brake pad assembly and brake disc.

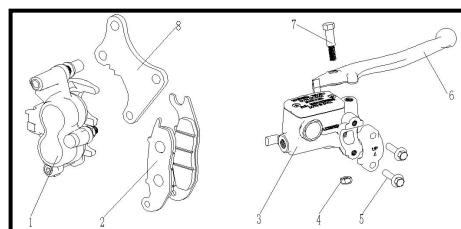
* Note

The grease on the front hydraulic brake pad assembly will result in reduction of the brake performance and thus brake failure.

Tighten bolts and nuts to specified torque values.

tightening bolts on the front shock absorber assembly:

**Installation screws on the front hydraulic brake disc
5-9 N•m**



There should be no oil stains on the front hydraulic brake pad assembly.

Oil stains on the front hydraulic brake pad should be cleaned off with the brake detergent solution.

* Note

Oil stains on the front hydraulic brake pad assembly will result in reduction of the brake performance.

Rear hydraulic brake

Disassembling:

Replace the brake pad assembly.

If the brake pad assembly will be used again, than

it should be marked at side before removal

so that it can be installed at its original position.

Remove the following assemblies from the left handle and motor.

Rear brake:

1. Oil pump body assembly
2. Front brake disc
3. Brake cylinder assembly
4. Brake pad assembly
5. Brake hose assembly
6. Hydraulic brake handle

* Note

•There should be no oil stains on the front hydraulic brake pad assembly in installing or removal.

•The cleaning should be made with a specified detergent to avoid reduction of the brake performance.

Loosen tightening bolts on the brake cylinder assembly.

Remove the brake cylinder assembly from the motor.

Inspection

Check the rear hydraulic brake pad assembly for wearing.

Replace brake shoes where necessary.

Measure thickness of the rear hydraulic brake pad assembly.

Measure thickness of the rear brake disc, and record the maximum value.

Specifications

N1SDiameter of the rear brake disc ϕ 180mm

Thickness of the rear brake disc 3.5mm

Thickness of the rear hydraulic brake pad 3.5mm

* Note

•The measurement should be made with a micrometer gauge.

Measure thickness of the front hydraulic brake pad assembly.

The brake disc and front hydraulic brake pad assembly should be replaced, if their thickness is less than the maintenance value or they are contaminated with the grease.

Usability limit: Rear hydraulic brake pad 3.0mm

Rear brake disc 3.0mm

Note:

The rear hydraulic brake pad assembly should be replaced in pairs.

The brake disc can be measured when it stays on the scooter without removal.

Installation

Install the rear brake disc and motor assembly.

Install the rear hydraulic brake pad assembly.

Install the rear brake hose assembly and brake cylinder assembly.

Install the oil pump body assembly and switch assembly.

Do not make the grease adhere to the rear hydraulic brake pad assembly and brake disc.

tightening bolts on the front shock absorber assembly:

Self-locking nuts on the motor 60-80 N·m

There should be no oil stains on the brake pad.

Oil stains on the brake pad should

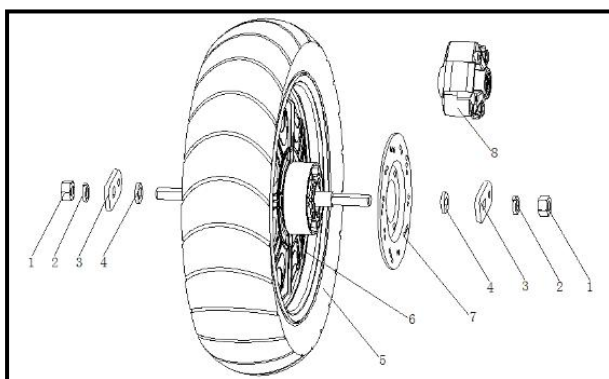
be cleaned off with the brake detergent solution.

Rear brake:

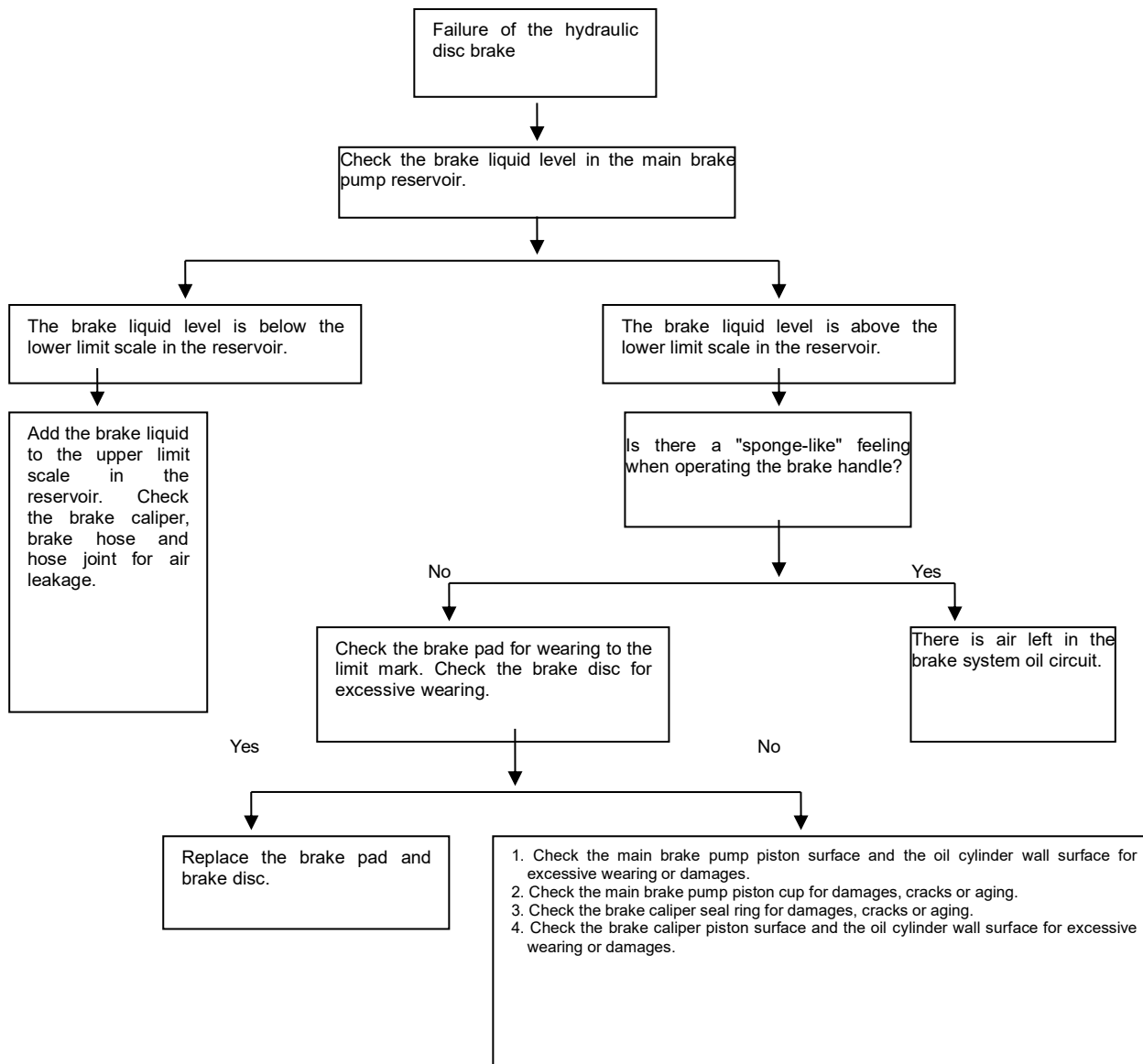
1. Bolt M6X30
2. Rear brake rocker assembly
3. Nut M6
4. Rear rim assembly 12×3.5
5. Self-locking nuts on the rear wheel
6. Camshaft on the rear brake
7. Brake shoe assembly
8. Brake shoe spring
9. Vacuum tire 120/70-12

*** Note**

Oil stains on the brake shoe pad will result in reduction of the brake performance.



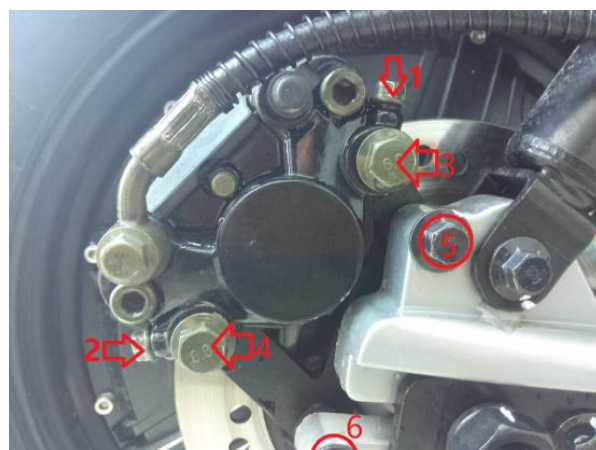
Failure diagnosis procedures for the hydraulic disc brake



Adjustment of the rear brake pad

The rear brake on Niu N1 is shown in the above figure:

- ① The bolts 1 and 2 are limit bolts used to adjust position of the brake caliper.
- ② The bolts 3 and 4 are used to adjust position of the brake caliper piston.
- ③ The bolts 5 and 6 are used to fix the brake caliper support.



Set up the overall scooter support for adjustment after knowing function of each bolt.

1. Loosen the bolts 1 and 2 properly with a 8mm socket (or spanner).
2. The brake caliper will move leftward and rightward in a large distance after loosening bolts (the following description is consistent with the scooter direction).
3. Turn on the ignition switch. Turn the right handle after release of the shift "P" so that the rear wheel rotates slowly. Shake the brake caliper leftward and rightward in rotation to find an angle at which the brake disc is not interfered at both sides, and then tighten the bolts 1 and 2. (Please perform operating carefully in this step to avoid finger sticking with the rotational wheel. The above is a precise operation. Do not wear gloves.)
4. Apply the left brake after adjustment (the left brake controls the rear wheel and the right brake controls the front wheel) to determine whether there is a friction. Repeat the above steps if so.

If the brake caliper rubs with the brake disc no matter how the adjustment is made after the third step, then the bolts 3 and 4 will be loosened slightly with a 12mm socket to adjust position of the brake piston (they should be loosened slightly each time).

The road driving is allowed only after test of the brake force to verify that it is normal following the adjustment.

Brake liquid change/air discharging (for the disc brake type)

Drainage of the brake liquid

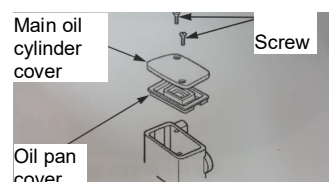
The paint coatings, plastics or rubber parts should be covered with cloths as good as possible to avoid splash of the brake liquid onto them in changing the system liquid or draining the liquid.

There should be no foreign matters that enter into the system in liquid injection into the liquid reservoir.

Turn the steering handle until the liquid reservoir on

main oil cylinder becomes horizontal, before removal of the main oil cylinder cover.

Remove screws, oil cylinder cover and oil pan cover from the main oil cylinder on front brake.



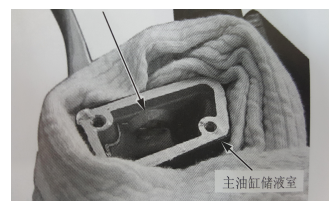
Connect the oil drainage hose to the oil drainage screw on front brake caliper.

Loosen the oil drainage screw and grasp the front brake handle tightly until the brake liquid does not flow out from the oil drainage screw.

Brake liquid injection/air discharging

Add the DOT3 or DOT4 brake liquid that has been sealed completely into

the liquid reservoir, and add it to the upper limit of the liquid level.



Note:

Do not use different types of the brake liquid because they are not compatible with each other.

The DOT3 or DOT4 brake liquid that has been sealed completely can be added.

Connect a commercially available air discharge pump from the brake liquid to the oil drainage valve screw.

Operate the air discharge pump from brake liquid, and loosen the oil drainage screw.

Check the brake liquid level frequently in air discharging to avoid air entrance into the hydraulic system.

Perform the discharging operation procedure strictly until the air discharging from hydraulic system is completed.

Seal thread of the oil drainage screw with a PTFE adhesive-tape, if the air can enter into the air discharge pump through the thread.

Tighten the oil drainage screw, and operate the brake handle. Repeat the air discharging operation if there is still a soft feeling.

Tighten the oil drainage screw on brake caliper after the air has been discharged completely.

The following operation steps can be performed if air discharge pumps from the brake liquid are not available.

Grasp the front brake handle tightly and pressurize the system until there are no air bubbles from the liquid reservoir hole and the resistance to the front brake handle is felt.

Connect the oil drainage hose to the oil drainage screw, and perform air discharging from the system as per the following steps:

Check the brake liquid level frequently in air discharging to avoid air entrance into the hydraulic system.

The brake handle should not be released before closure of the oil drainage screw.

Grasp the front brake handle for several times, and then hold the front brake handle at the same time to loosen the oil drainage screw to 1/2 circle. Wait for several seconds to tighten the oil drainage screw.

Loosen the front brake handle slowly until the front brake handle reaches to end of its travel. Wait for several seconds.

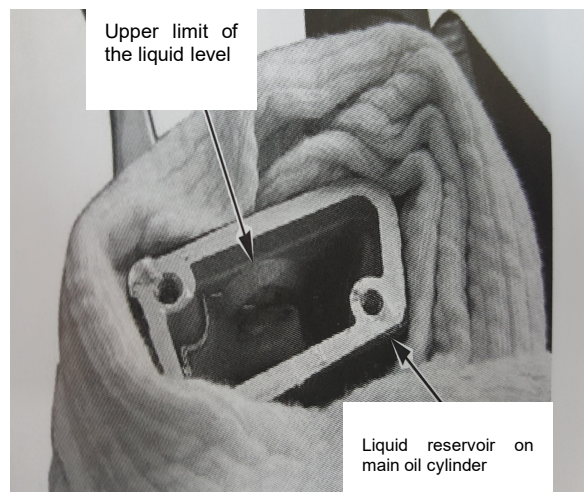
Repeat steps 1 and 2 until there are no air bubbles from the oil drainage hose.

Tighten the oil drainage screw on brake caliper after the air has been discharged completely.

Add the DOT3 and DOT4 brake liquid that has been sealed completely into

the liquid reservoir, and add it to the upper limit of the liquid level.

Install the oil pan cover and oil pan diaphragm. Tighten screws on the main oil cylinder.



Lithium battery/charger

Maintenance Information

Parameter specification

Battery pack

Battery test

Charger Inspection

Lithium battery/charger

Maintenance Information

Overview

The charger will be thermal in charging. It should be subject to good ventilation and radiation. The battery and charger must not be covered. They must not be close to flammable or explosive objects in charging to avoid the explosion or fire that may even cause personal injuries.

There is a high-voltage current in the charger when the charging is made. The charger is prohibited strictly from being touched or opened in order to prevent electric shock.

The charging should be made indoor and should not be made at an open site in order to prevent the electric shorting or firing due to rain and other factors. The charging is prohibited strictly from being made in a rainy, exposure or high-temperature environment or close to fire sources.

The dedicated charger made by an original manufacturer and a stable 110-240V AC power supply should be used in charging. The polarity of the charger output connector must be consistent with that of the battery output connector, otherwise the charger and battery will be damaged.

Note:

The power supply lock and air switch should be turned off before removal of electric elements.

The terminal or connector removal or connection may lead to damages of some units when the power supply lock is opened and there is a current.

The battery used for this model is a lithium battery.

Remove the battery from the scooter for scooter storage for a long time. Charge the battery to approximately 50% of its capacity and store it at a room temperature. Perform periodical charging of the battery. The long-term storage in lack of the electricity is strictly prohibited.

The battery should be fully charged for use after long-term storage.

The original battery for this model must be charged with the dedicated charger that accompanies with the scooter (the scooter charging with a non-original charger will cause irrecoverable damages to the battery). Charging with a non-original charger may lead to the circuit or battery failure.

The scooter charging is prohibited strictly from being made immediately after scooter stop. The charging should be made when the battery surface has been naturally cooled down (it is recommended to make charging after 30 minutes).

Stop charging immediately if the battery has not been fully charged for more than 24 hours and the red lamp does not turn to green, and then contact the after-sale service for inspection of the charger and battery.

Parameter specification

Item		Specifications
Battery	Type	Enclosed lithium battery
	Rated voltage	60V
	Rated capacity	20Ah~30Ah
Charger	Rated output voltage	69.7V
	Rated output current	3~4A

Battery pack



Operation/maintenance instruction

Serial number of the battery pack



Charger interface

Battery model

Battery test

The battery management system software on an upper computer is used.

Note:

It must be ensured that the corresponding software has been installed on the computer and the stable linking with the corresponding hardware has been established.

Term definition:

BMS: battery management system.

Main controller: the main chip that makes acquisition, processing and control of the hardware, which is a core component of BMS.

Auxiliary controller: the chip that makes acquisition and transmission of the battery pack data to the main controller, which is a core component of BMS.

SOC: the battery charge percentage used to indicate the battery energy percent.

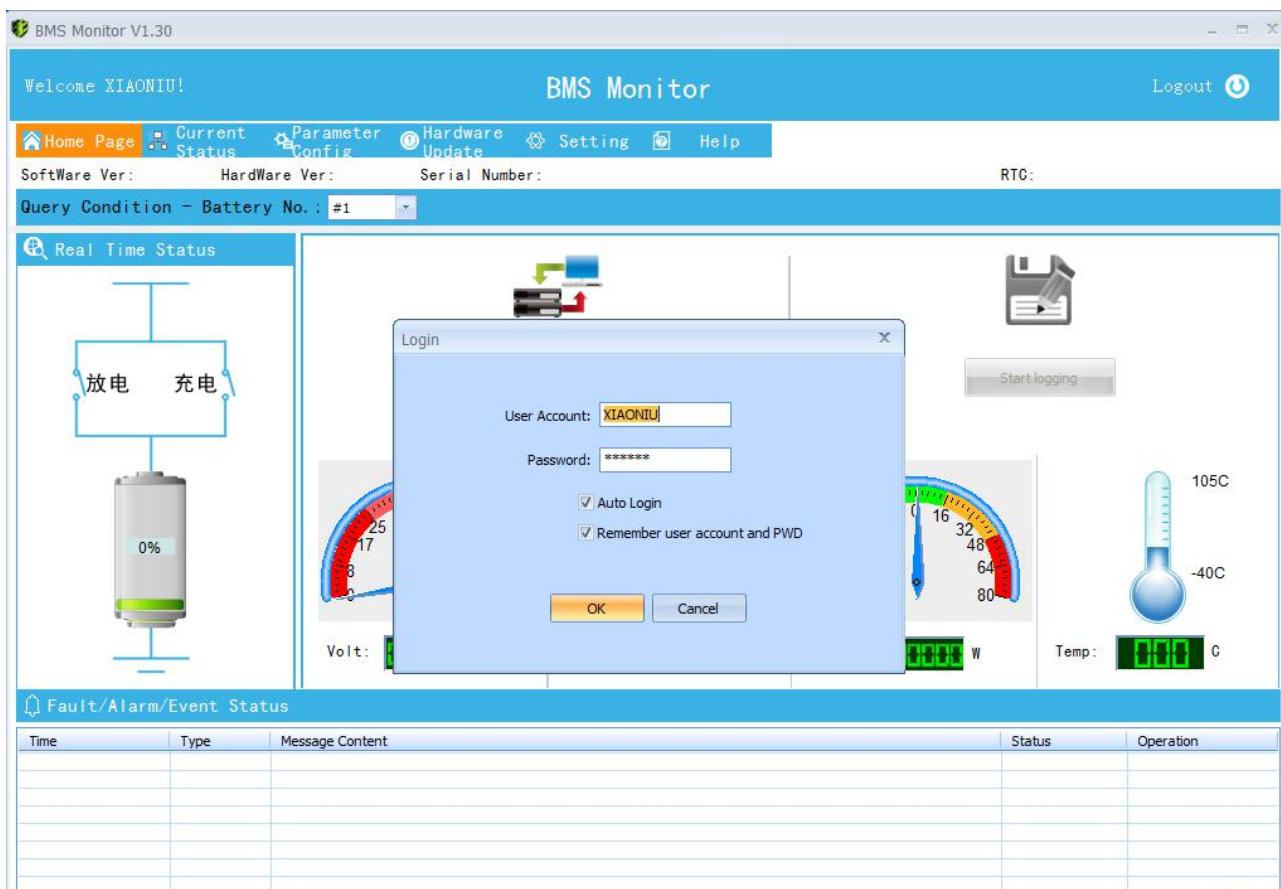
Software function:

The battery management system software on upper computer is used to acquire the information that indicates battery pack characteristics, set parameters, view the log, and upgrade the battery pack firmware version.

Software operation method:

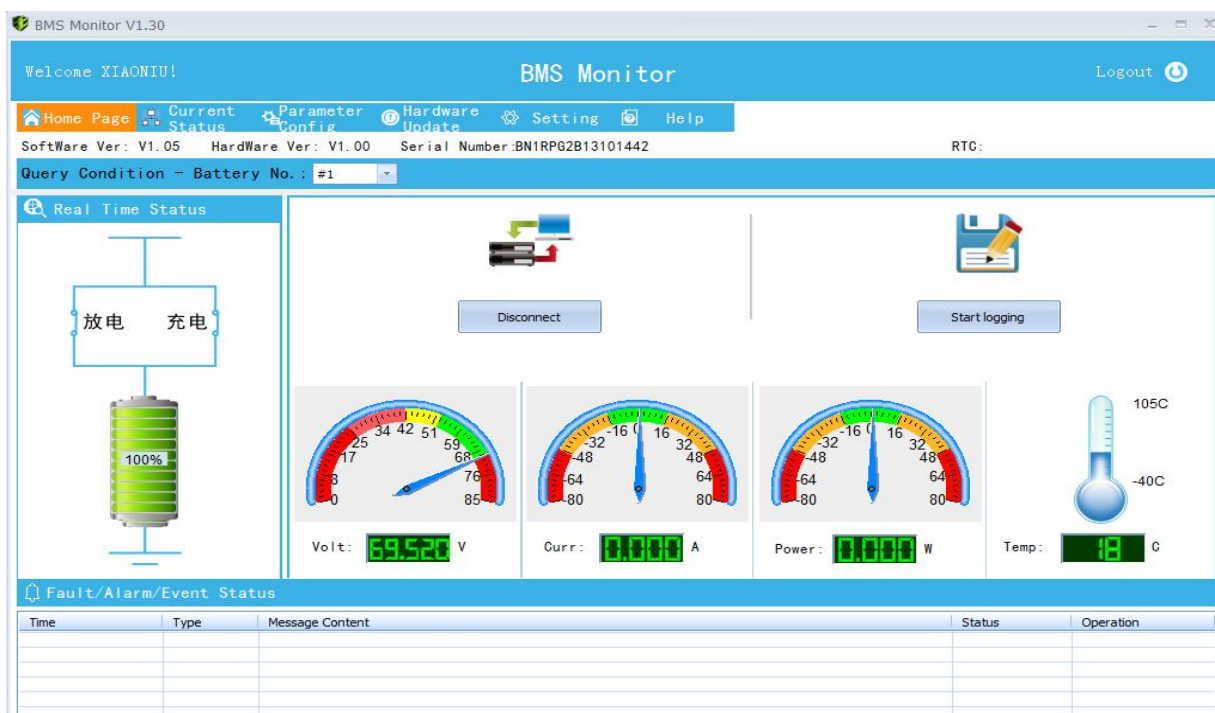
System log-in

Run the program. The system log-in window appears.



Input the user name and password. Click on OK. The system interface appears after log-in verification.

System interface



The system interface consists of two parts - an upper part with the information about system title bar, menu bar and battery pack and also the inquiry condition, and an lower part with menu contents. Display of the menu **Home** content is by default when the system is turned on. Click on the **Home** menu in the menu bar to switch from other menu pages to the home page.

The system will search an available link automatically after its initial startup.

Current status

Click on the **Current Status** menu in the menu bar to display the content of current status page within lower part of the window, as shown below:

This page contains two labels titled respectively as Battery **Battery Pack Information** and **Unit Information**.

The label **Battery Pack Information** is used to display the status information, failure warning and event information related to battery pack.

The status information is displayed in the form of real-time data.

The failure warning and event information are displayed in the form of status icon and failure warning and event description. A gray status icon means that the corresponding status has not been acquired.

A green icon means that the corresponding status is normal.

A red icon means that the corresponding status is abnormal.

The label **Unit Information** is used to display the information about battery monomers", as shown in the figure:

The current voltage of each monomer is displayed. The number of monomers displayed varies dynamically with the battery pack being connected.

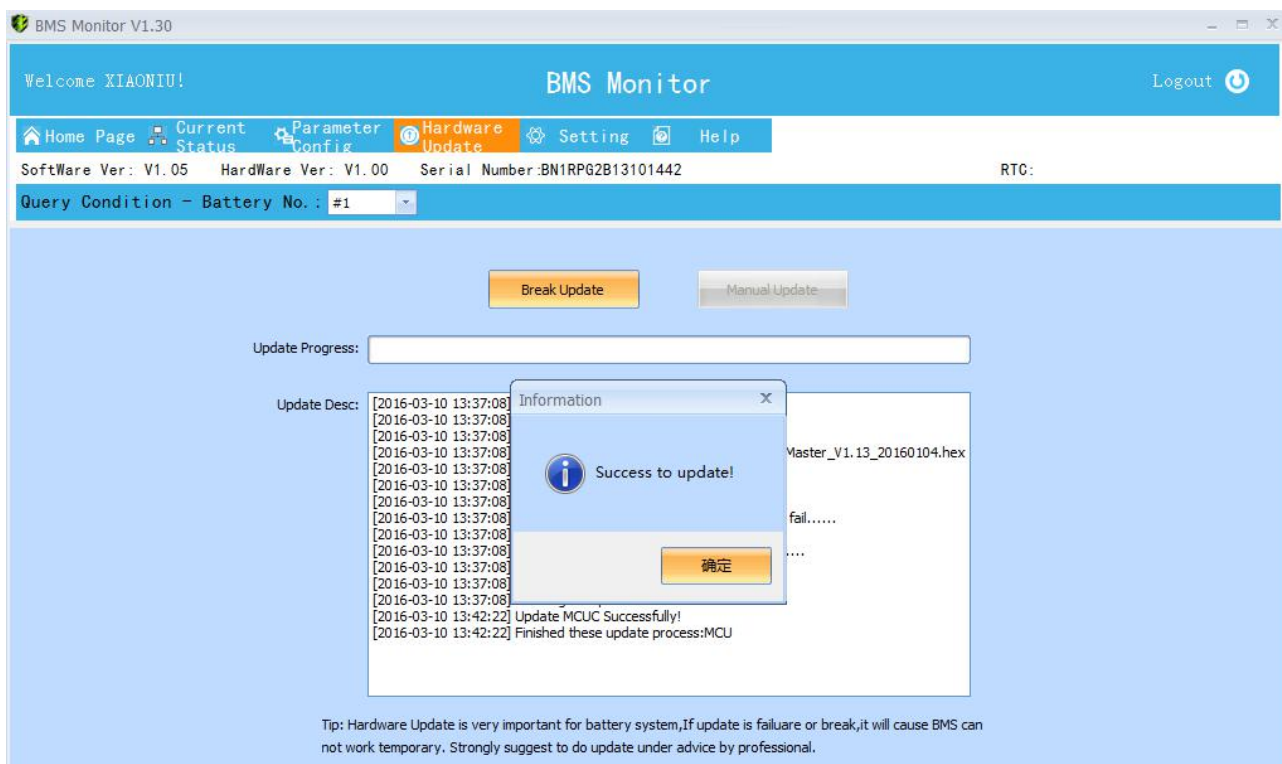
The voltage information from up to 39 monomers can be displayed.

Firmware upgrading

Click on the menu of **Firmware Upgrading** in the menu bar to display the content of firmware upgrading page within lower part of the window, as shown in the figure.

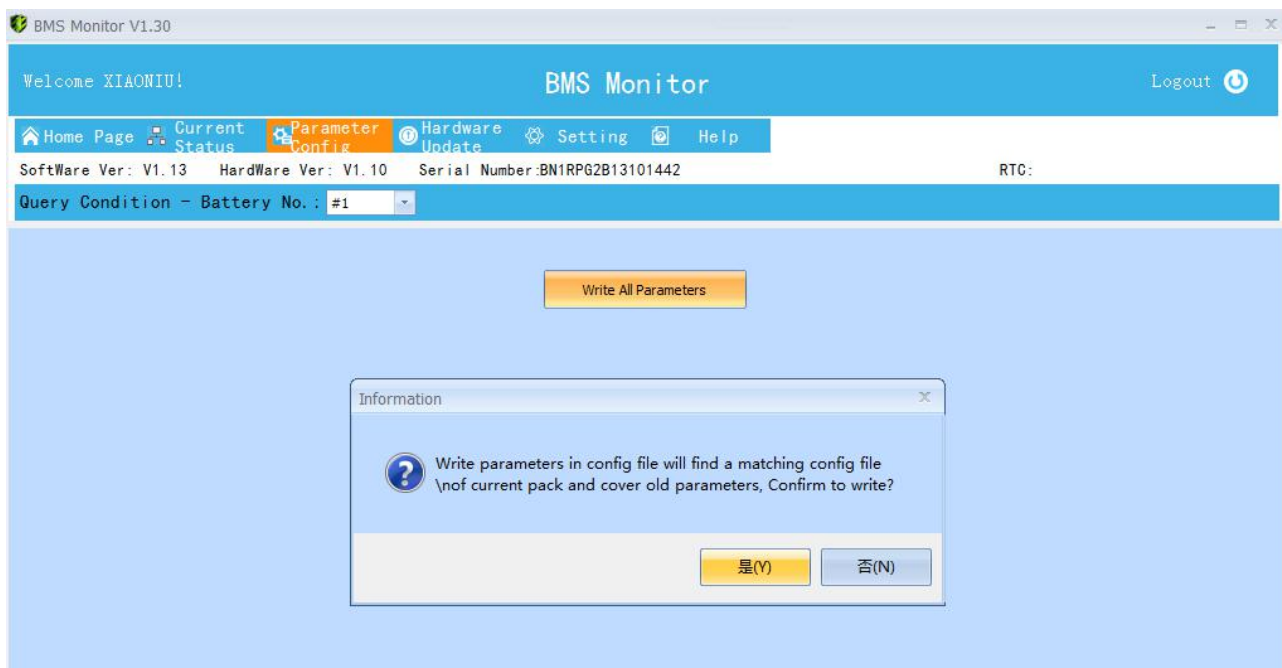
The firmware upgrading is complicated and important. It has been significantly simplified for easy operation by common users. There are only two buttons in the page, which are used respectively for automatic and manual upgrading. Click on the **Auto Upgrading** button, and then the system will automatically search the upgrading file under fixed directories. The current upgrading covers upgrading of four types of the firmware - system SOC, auxiliary controller, communication module and main controller. The system will search the latest upgrading files for corresponding modules in the sequence of SOC->auxiliary controller->communication module->main controller, and then make upgrading. Multiple self-test items for monomers will be also carried out in upgrading the most important main controller to ensure the upgrading safety, as shown in the figure:

The upgrading progress will be displayed in the upgrading progress bar. The steps and the information involved in upgrading will be detailed within the upgrading description box so that users can view and be aware of various messages and conditions that may occur in upgrading. Upgrading files are generally provided by a battery pack manufacturer. They are very professional and the common users do not need to be concerned of their details. The prompt window will appear when the upgrading is completed, as shown in the figure:

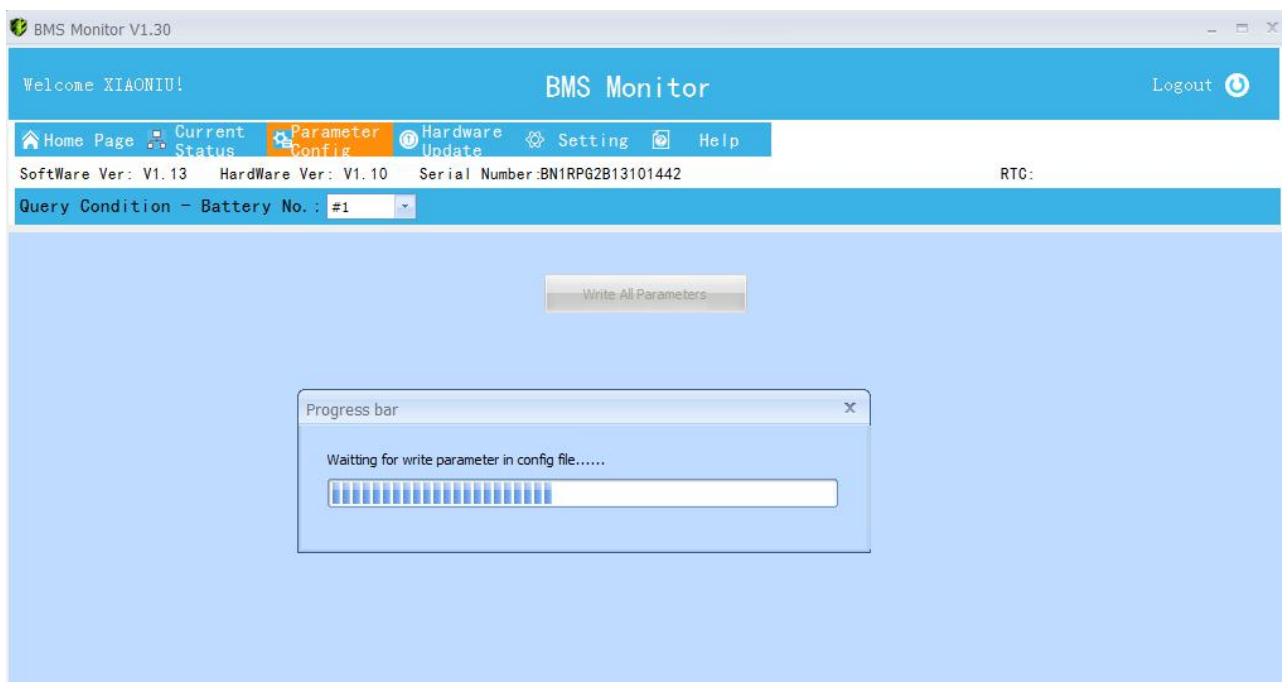


Parameter configuration

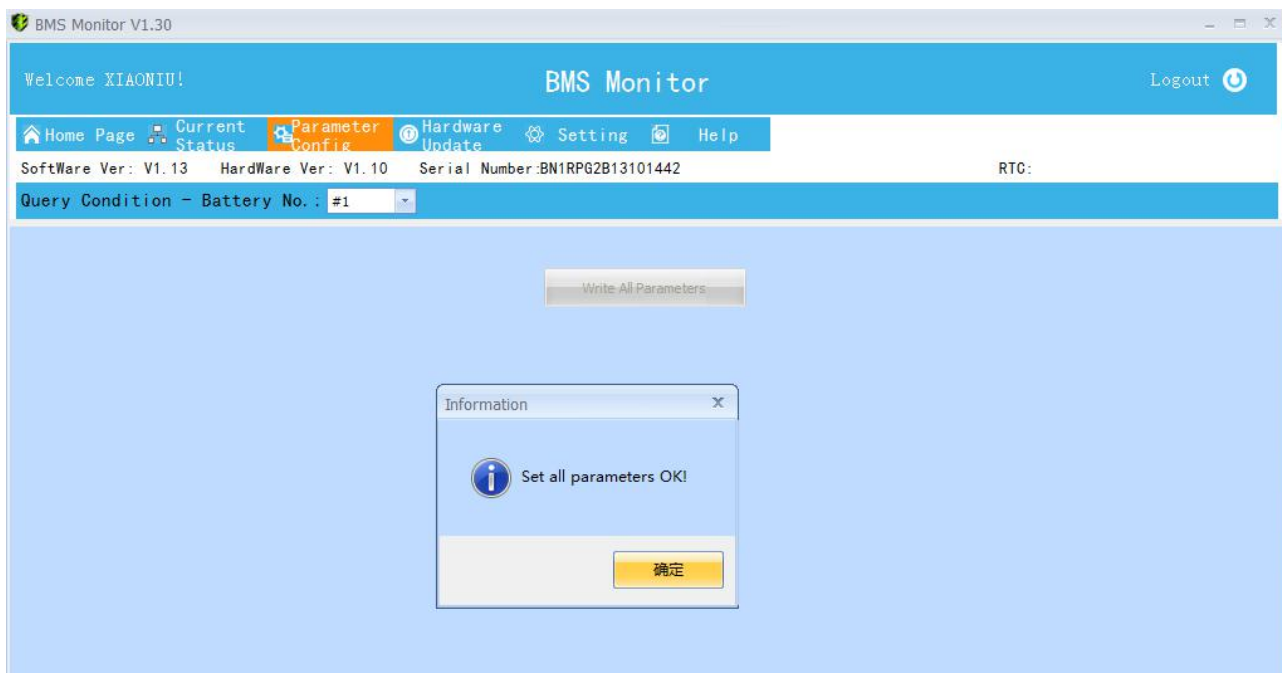
Click on the **Parameter Settings** menu in the menu bar to display the content of parameter configuration page within lower part of the window, as shown in the figure:



There are many parameters involved in the battery pack, and the knowledge about these parameters is very professional. The complicated parameter configuration has been significantly simplified in the system for easy operation by common users. There is only one button displayed in the page, which is titled as "write parameters in the configuration file". Click this button to automatically search parameter configuration files under fixed folders, read the latest parameter configuration file and write it into the battery pack, as shown in the figure:



The prompt window will appear when the writing is completed, as shown in the figure:



Charger

Inspection

The original battery for this model must be charged with the dedicated charger that accompanies with the scooter (the scooter charging with a non-original charger will cause irrecoverable damages to the battery). Charging with a non-original charger may lead to the circuit or battery failure.

The scooter charging is prohibited strictly from being made immediately after scooter stop. The charging should be made when the battery surface has been naturally cooled down (it is recommended to make charging after 30 minutes).

Stop charging immediately if the battery has not been fully charged for more than 24 hours and the red lamp does not turn to green, and then contact the after-sale service for inspection of the charger and battery.

1. Connect the charger plug to a 110-240V home socket.

The charger indicator illuminates as green since the battery has not been connected.



Connect the battery for charging. The battery indicator illuminates as red in charging. It will turn to be green when the battery is fully charged. The charging should be stopped by disconnecting first the 110-240V AC power supply and then the scooter charger socket.

Test of the charger output voltage

Connect positive and negative terminals on the charger plug to a digital multimeter that is commercially available for measurement of the charger output voltage.

Motor/controller/accelerator handle (Hall cable sensor)

Maintenance Information

Technical parameters

Failure elimination

Inspection of the motor winding resistance

Inspection of the motor insulation

Inspection of the maximum motor no-load current

Inspection of the Hall motor sensor

Controller

Hall cable sensor Inspection

Motor/controller/Hall cable sensor

Maintenance Information

Overview.

The motor used in this scooter is an efficient brushless DC motor with a permanent magnet made of rare earths, which is integrated with the rear wheel.

The motor does not require maintenance in daily operating. However, attention should be paid to the status of installation and tightening nuts on the motor shaft.

The motor is integrated with the rear wheel. Attention should be paid to inspection of the tire pressure during maintenance. Driving at an insufficient tire pressure will cause damages to the motor hub.

The motor should be stopped immediately when the motor is abnormally hot, smoking, smelling abnormally, sounding abnormally or has other abnormal conditions.

Check the battery for normal performance and make it charged fully before maintenance of the motor system.

Check the Hall cable sensor connector, Hall motor connector and controller connector for shorting due to moisture, looseness or bad contact before maintenance of the motor system.

Attention should be paid to proper maintenance of the motor system and appropriate protection measures for avoidance of the electric shock, since the high current and voltage are involved.

The Hall cable sensor and Hall motor sensor should be inspected for shorting before replacement of the damaged controller with a new one, otherwise the new controller that has been installed will get damaged again.

The motor temperature rises higher and faster in a high-altitude area than in a plain area. Thus the scooter operating for a long time will easily result in the situation where the motor becomes abnormally hot and even the motor fails.

Pay attention to the wire polarity in installing the battery or controller.

Technical parameters

Item		Specifications	
Motor	Motor type	Brushless permanent-magnet motor	
	Control method	FOC vector control	
	Rated voltage	DC60V	
	Rated power	1200W	1500W
	Maximum motor power	2000KW	2400w
	Maximum motor torque	110N*m	120N*m
Controller	Rated voltage	DC60V	
	Undervoltage protection	52±1V	
	Maximum current of the controller	35A	40A

Failure elimination

The instrument has no indication. The motor does not rotate.

1. Inspection of the air switch

Is the air switch closed or does the fuse get melted?

Yes - the instrument is shorted.

The scooter cable is broken or shorted.

Positive and negative poles of the battery are connected reversely.

The controller failed.

No - go to step 2.

2. Inspection of the battery pack

Check voltage of the battery pack.

Yes - the battery is under-voltage

The battery is protected by BMS

No - go to step 3.

3. Inspection of the power supply lock switch

Is the ignition switch able to be turned on normally?

Yes - the power supply lock has an open circuit

No - go to step 4

4. Inspection of the alarm

Is the alarm able to operate normally?

Yes - the alarm failed

No - go to step 5

5. Inspection of the DC-DC (60V-12V) converter

Is the converter able to operate normally?

No - the air switch failed.

The instrument has normal indication but the motor does not rotate.

1. Inspection of the startup switch at shift P

Is the startup switch shorted? (the shift P can not be released)

Yes - the startup switch failed

No - go to step 2

2. Inspection of the Hall cable sensor

Turn the handle to measure signal voltage of the Hall cable sensor.

Is the signal voltage constant and less than 0.85V?

Yes - the Hall cable sensor failed.

No - go to step 3

3. Inspection of the Hall unit

Manually turn the motor (rear wheel) to check the Hall signal voltage.

Does the Hall signal voltage change between 0 - 5V?

No - the Hall motor unit failed

Yes - go to step 4

4. Controller inspection

Is the input voltage to controller power supply correct? Is the controller indicator flashing? Is it in the braking condition?

Yes - the power cut-off brake switch is shorted or the controller failed

No - the input circuit to controller power supply is open or short

The controller failed.

The motor rotates and stops intermittently.

1. Inspection of the battery pack voltage

Check the battery pack voltage.

Is the voltage at the critical under-voltage point? Is the battery in a bad condition?

Yes - the battery pack voltage is insufficient

The capacity of a single or multiple batteries is reduced

The battery connector is in a bad contact.

The charger failed

2. Inspection of the startup switch

Is the startup switch in a bad contact?

Yes - the startup switch failed or the wire is in a bad contact

No - go to step 3

3. Inspection of the Hall cable sensor

Is the Hall cable sensor in a bad contact?

Yes - the Hall cable sensor failed or the wire is in a bad contact

No - go to step 4

4. Inspection of the power supply lock

Is the power supply lock in a bad contact?

Yes - the power supply lock failed or the wire is in a bad contact

No - go to step 5

5. Controller inspection

Check the controller wire for bad contact

Yes - the controller wire is in a bad contact

No - the controller damaged

The motor rotates slowly

1. Inspection of the battery pack voltage

Is the battery pack in a bad condition? Is the voltage low?

Yes - the battery pack voltage is insufficient

The capacity of a single or multiple batteries is reduced

No - the communication with BMS in the battery pack failed

Go to step 2

2. Inspection of the Hall cable sensor

Turn the speed regulation handle to the maximum angle, and check the output signal voltage.

Is the voltage far less than 3.75V?

Yes - the Hall cable sensor failed.

No - go to step 3.

3. Controller inspection

Perform inspection by controller switching as per the elimination method.

Is the failure eliminated?

Yes - the controller failed

No - go to step 4

4. Motor inspection

Perform inspection by motor switching as per the elimination method.

Is the failure eliminated?

Yes - the motor failed

The motor is shaking

The Hall motor sensor connector is in a bad contact

The Hall cable sensor connector is in a bad contact

Out of control (the scooter flies)

The accelerator cable is too tight and it is tensioned. The Hall cable sensor works.

The Hall cable sensor failed

The controller failed.

The motor noise is big

The bearing is worn

The rotor interferes with the stator

The magnetic steel is loosened and falls off

Inspection of the motor winding resistance

Disconnect 3 phase wires (thick blue, green and yellow wires) in the motor cable from the controller connector as shown in the figure.

Check the resistance between phase wire connectors at one side of the motor.

Connection: Phase wire - phase wire

Standard: $1.2 \pm 0.2 \Omega$

Replace the motor assembly if the reading is far more than the standard value.

Inspection of the motor insulation (creepage)

Set up the kickstand stably on a flat ground.

Check the battery pack voltage and perform full charging.

Turn the ignition switch to OFF. Set the multimeter at the shift of AC voltage measurement. Connect the probe (+) to the negative wire of vehicle charger socket or the negative battery wire. Connect the probe (-) to the motor shaft.

Turn the ignition switch to ON. Release the shift P. Turn the accelerator handle to the maximum angle and run the motor continuously for more than 10 seconds.

Read the measured voltage U1 when the multimeter value becomes stable.

Standard: $\leq 1V$

The measured voltage U1 that is $\leq 1V$ indicates that the motor insulation is normal without creepage.

If the measured voltage U1 is more than 1V, then the inspection in the next step is performed.

Turn the ignition switch to OFF. Short the vehicle saddle lock and rear bottom fork with a short wire.

Turn the ignition switch to ON. Release the shift P. Turn the accelerator handle to the maximum angle

and run the motor continuously for more than 10 seconds.

Read the measured voltage U2 when the multimeter value becomes stable.

Standard: $\leq 1V$

The measured voltage U2 that is $\leq U1$ indicates that the motor insulation is normal without creepage.

The measured voltage U2 that is more than 1V indicates that the motor insulation is bad. The motor assembly should be replaced.

Inspection of the maximum motor no-load current

Set up the kickstand on flat ground.

Check the battery pack voltage and perform full charging.

Turn the ignition switch to OFF. Set the multimeter at the shift of 20A for DC measurement. Connect the probes (+) and (-) with the input wire to controller power supply in series.

Turn the ignition switch switch to ON. Release the shift P. Record the maximum value A1 of the multimeter current.

Turn the accelerator handle to the maximum angle. Record the maximum value A2 of the multimeter current after the motor has operated stably for 5 minutes.

Calculate the maximum motor no-load current A.

Calculation: $A = A2 - A1$

Standard: $\leq 3.5A$

The measurement value that is more than the standard one indicates that the motor assembly may be in a bad condition as blow:

1. The internal motor friction increases
 - The bearing is damaged
 - The stator interferes with the rotor
2. The motor winding is shorted locally
3. The magnetic steel is aged, demagnetized or falls off

Inspection of the Hall motor sensor

Remove the storage box.

Inspection of the signal output

Turn the ignition switch to OFF.

Connect Hall phase output wires and negative ground wire of the motor. Turn the ignition switch to ON. Manually turn the rear wheel and check the DC voltage between both.

Connection: Yellow (+) - negative wire (black) (-)

Green (+) - negative wire (black) (-)

Blue (+) - negative wire (black)

Standard: 0 - 5V

The voltage of each phase should change between 0 and 5V. The voltage that does not change indicates that the corresponding Hall motor sensor failed.

Inspection of the ground wire

Remove the storage box.

Check the connectivity between the black wire of Hall motor connector and the negative battery pole.

Connection: black (+) - negative battery pole (black) (-)

Normally the connectivity between both should be available.

Inspection of the input circuit to power supply

Turn the ignition switch to OFF.

Disconnect the Hall motor connector.

Turn the ignition switch to ON. Check the voltage between the red wire and the negative battery pole at harness side.

Connection: Red (+) - negative battery pole (black) (-)

Standard: 5V

Check the following items if the measurement value is far more than the standard one:

- The controller failed
- The circuit between controller and Hall motor is in a bad contact or is open.

Controller

System introduction

The controller for this model makes controlling in the way that it receives the signal from speed regulation handle and controls operation of the brushless DC motor.

Main protective functions

1. Current limit protection

The maximum controller output current is limited to protect the motor, controller, battery and other components from being damaged by a current greater than specified.

2. Rotation failure (overload) protection

The controller judges the motor status automatically in a certain period of time after the motor rotation failure (over-current) occurs. It controls automatically the output current to protect safety of the motor, controller and battery.

3. Under-voltage/over-voltage protection

The controller stops automatically the motor rotation when the input voltage to motor is lower or higher than the set value, in order to protect safety of the motor and extend the battery lifetime.

4. Power cut-off protection in charging or braking

The controller stops the motor automatically to avoid unexpected injuries when the vehicle is being braked or charged.

5. Control loss protection

The controller stops the motor automatically to avoid unexpected injuries when the Hall cable sensor or its circuit fails and is out of control. The functions such as motor temperature protection, controller temperature protection and motor winding short protection are also provided.

Removal/installation

Remove the storage box on rear seat cask

Disconnect the battery. Turn the ignition switch and air switch to OFF.

Disconnect connectors on the controller.

Remove 4 installation bolts and the ground wire.

Remove the controller.

Perform the re-installation in the opposite sequence to the removal.

Air switch

Removal/installation

Remove the storage box on the seat cask.

Turn the ignition switch and air switch to OFF.

Loosen the wire clamping bolt.

Disconnect the air switch wire.

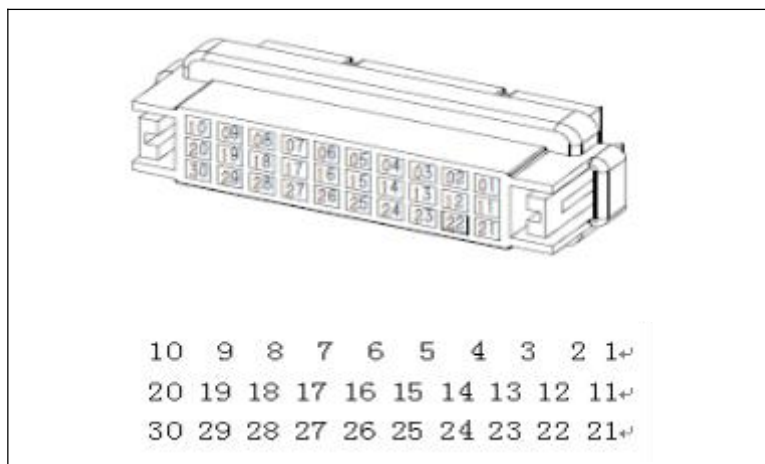
Remove tightening bolts on the air switch to take out the air switch.

Perform the re-installation in the opposite sequence to the removal.



Controller cable connector

Component name	Motor controller	Interface number	J26-A J26-A
Connector type	Connector 30P-J2X		
Interface definition			
PIN	Color	Definition	
1	White and yellow	Three speeds	
2	White and blue		
3	White and black	Three speeds	
4	Blue	EBS earth	
5	Orange	ACC ignition switch	
6	Violet	High brake lamp	
7	Blue	EBS	
8	White	RS485(A)	
9	Black	BOOST	
	Black and white	Earth 485	
	Black	Cruise earth	
10	Gray	Cruise	
11	Violet and gray	RS485(B)	
12	Brown	BOOST	
13	Black	Handle	
14	White and green		
15	Dark red		
Legend			



Inspection of the input circuit to power supply

Turn the ignition switch and air switch to OFF.

Voltage of the main power cord

Disconnect the following connectors:

- Controller connector
- Red and black input wire connectors to the power supply

Check the DC voltage between the red wire and the negative battery pole or black wire at harness side.

The battery voltage should be available when turning the ignition switch and air switch to ON. It indicates that the circuit is normal.

Voltage of the 12V power cord

Disconnect the controller connector.

Check the voltage between the red/black wire and the negative battery pole at harness side.

Connection: Red/black (+) - negative battery pole (black) (-)

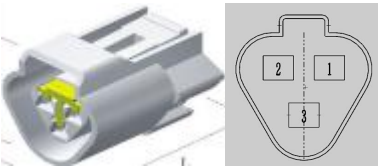
Standard: $12\pm 0.2V$

Check the following items if the measurement value is more than the standard one after turning the ignition switch and air switch to ON:

- The DC converter failed
- The fuse is broken
- The ignition switch is in a bad contact or has an open circuit.
- The air switch is in a bad contact or has an open circuit.

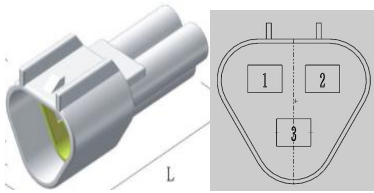
Hall cable sensor

Harness interface

Component name	Handle	Interface number	J17-B
Interface definition			
PIN	Color	Definition	
1	Dark red	Power cord	
2	White and green	Signal wire	
3	Black	Ground wire	
Legend			
			



Component interface

Component name	Handle	Interface number	J25-A
Interface definition			
PIN	Color	Definition	Wire length
1	Dark red	Power cord	50cm
2	White and green	Signal wire	
3	Black	Ground wire	
Legend			
			

Inspection

Inspection of the signal output

Turn the power lock switch to OFF.

Remove the front panel.

Connect the multimeter between the white/green signal output wire and the black ground wire on Hall cable sensor.

Turn the ignition switch to ON. Turn the handle slowly from the start angle to the end angle, and check the signal output voltage between them.

Connection: White/green (+) - black (-)

Standard: Start angle 0.83 - 0.9V

End angle 3.75 - 3.85V

The voltage should change smoothly between standard values with turning of the accelerator handle.

Inspection of the input circuit to power supply

Turn the ignition switch to OFF.

Disconnect the Hall cable sensor connector.

Turn the ignition switch to ON. Check the voltage between the dark red wire and the black wire.

Connection: Dark red (+) - black (-)

Standard: 4.2V-5V

Check the following items if the measurement value is far more than the standard one:

- The controller failed
- The circuit between controller and Hall cable sensor is in a bad contact or is open.

Lighting/instrument/switch

Maintenance Information 错误！未定义书签。

Specifications

Inspection of the vehicle light system

Front headlight.....

Turn signal lamp.....

Rear tail lamp assembly.....

The turn signal lamp.....

The braking signal lamp.....

Liquid crystal instrument display.....

Power lock.....

Left and right combination switches

Right combination switch

Turn signal flashing relay

Remote alarm

Central control panel assembly

Hall cable sensor

DC-DCconverter

Charger interface

Cruise at a fixed speed

Lighting/instrument/switch/central controller/alarm

Maintenance Information

Overview

Check status of the battery pack before performing any inspection that requires provision of a proper battery voltage.

The switch that has been installed on the electric vehicle can be tested for connectivity.

The bulb will be hot when the light turns on and keep hot for a while after the light turns off. Be sure that the bulb has been cooled down before performing maintenance.

Make sure that the power switch is OFF in light replacement.

Do not use lights with different specifications.

Check the light circuit for normal operation after replacement with a new light.

Specifications

Electric system	
Item	Specifications
Front headlight	12V LED
Turn signal lamp	12V LED
Rear tail lamp	12V LED
Brake lamp	12V LED
Instrument	12V LCD instrument panel
Central control unit	12V
USB charging interface	5V 1A

Inspection of the vehicle light system

Front headlight assembly

Failure elimination

The front headlight does not illuminate or the lighting is weak.

Standard inspection

- Whether the LED bulb is burnt or there is weld missing
- Whether the connection circuit is loose
- Light switch
- Dimmer switch

Check the following items if all the above items are normal:

Check the vehicle light circuit

Remove the front panel

Disconnect the white 4P connector of the front headlight



Harness interface			
Component name	Front headlight	Interface number	J13-B
Interface definition			
PIN	Color	Definition	
1	Blue	High beam	
2	White	Low beam	
3	Black	Ground wire	
4	Red and white	Power cord (12V)	
Legend			

Component interface			
Component name	Front headlight	Interface number	J13-A
Interface definition			
PIN	Color	Definition	Wire length
1	Blue	High beam	20cm
2	White	Low beam	
3	Black	Ground wire	
4	Red and white	Power cord (12V)	
Legend			

Turn signal lamp

Front turn signal lamp

The turn signal lamp does not illuminate or the lighting is weak.

Check the following components:

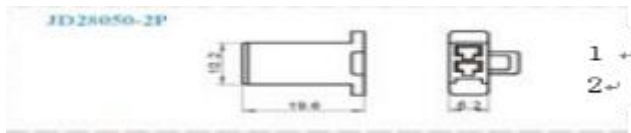
- Whether the light bulb is burnt or there is weld missing on the bulb
- Whether the connection circuit connector is loose
- Whether the light switch is in a bad contact

Harness interface			
Component name	Left turn signal lamp	Interface number	J7-B
Interface definition			
PIN	Color	Definition	
1	Yellow	Left turn signal lamp	
2	Black	Ground wire	
Legend			

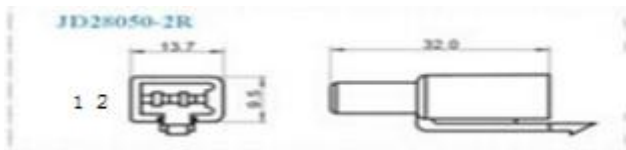
Component interface			
Component name	Left turn signal lamp	Interface number	J7-A
Interface definition			
PIN	Color	Definition	Wire length
1	Yellow	Left turn signal lamp	60cm
2	Black	Ground wire	
Legend			

Definition of the right turn signal lamp interface

Harness interface

Component name	Right turn signal lamp	Interface number	J8-B
Interface definition			
PIN	Color	Definition	
1	Light blue	Right turn signal lamp	
2	Black	Ground wire	
Legend			
			

Component interface

Component name	Right turn signal lamp	Interface number	J8-A
Interface definition			
PIN	Color	Definition	Wire length
3	Light blue	Right turn signal lamp	60cm
4	Black	Ground wire	
Legend			
			

Rear tail lamp assembly


The turn signal lamp does not illuminate or the lighting is weak.

Standard inspection

Check the following components:

- Whether the LED bulb of the turn signal lamp is burnt or there is a missing weld
- Whether the connection circuit is loose
- Light switch
- The flashing unit failed
- The alarm failed

Harness interface			
Component name	Tail lamp	Interface number	J9-B
Interface definition			
PIN	Color	Definition	
1	Red and white	Power cord (12V)	
2	Black	Ground wire	
3	Violet	High brake lamp	
4	Yellow	Left lamp signal wire	
5	Light blue	Right lamp signal wire	
6			
Legend			
<p>JD28050-6P</p> <p>Dimensions: 14.2 (height), 19.8 (width), 11.2 (width of pin area)</p> <p>Pin layout: 1 2↕, 3 4↕, 5 6↕</p>			

Component interface			
Component name	Tail lamp	Interface number	J9-A
Interface definition			
PIN	Color	Definition	Wire length
1	Red and white	Power cord (12V)	20cm
2	Black	Ground wire	
3	Violet	High brake lamp	
4	Yellow	Left lamp signal wire	
5	Light blue	Right lamp signal wire	
6			
Legend			
			

The braking signal lamp does not illuminate


Standard inspection

Check the following components:

- Whether the LED bulb of the braking signal lamp is burnt or there is weld missing
- Whether the connection circuit is loose
- Brake power cut-off switch



Brake power cut-off switch

Component interface			
Component name	Left/right brake handle		J16-B
Connector type	4.0 dual-cylinder insertion spring		
Interface definition			
PIN	Color	Definition	
1	Red and white	Power cord (12V)	
2	Violet	Left/right brake handle signal wire	
Legend			
			

Front brake lamp switch (brake power cut-off switch)

Remove the front panel.

Disconnect the brake lamp switch connector or the wire connector, and check the connectivity between terminals at switch side.

The connectivity should be available when the front brake handle is pressed. There should be no connection when the front brake handle is released.

Rear brake lamp switch

Remove the front panel.

Disconnect the brake lamp switch connector or the wire connector, and check the connectivity between terminals at switch side.

The connectivity should be available when the rear brake handle is pressed. There should be no connection when the front brake handle is released.

Liquid crystal instrument display/power lock

Description of instrument icons

Left turn indicator

Right turn indicator

High beam indicator

Parking indicator

Low electricity indicator

Ambient temperature

Best energy consumption status

Electric energy recovery status

Ride mode

Real-time speed

Charged electricity percentage

Electricity display bar

Electricity percentage

Remainder of the charging time

Charging status

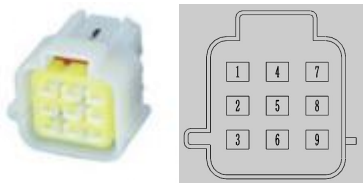
Total driving mileage

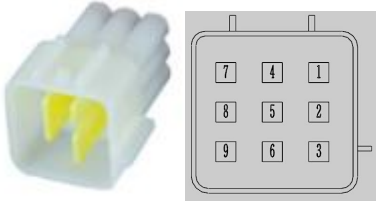
Real-time current display bar

Failure code display



Harness interface

Component name	Instrument	Interface number	J6-B
Interface definition			
PIN	Color	Definition	
1	Red and white	Power cord (12V)	
2	Black	Ground wire	
3	Yellow	Left turn lamp	
4	Light blue	Right turn lamp	
5	Blue	High beam	
7	White	Communication A	
8	Violet and gray	Communication B	
9	Black and white	Earth 485	
Legend			
			

Component interface			
Component name	Instrument	Interface number	J6-A
Interface definition			
PIN	Color	Definition	Wire length
1	Red and white	Power cord (12V)	50cm
2	Black	Ground wire	
3	Yellow	Left turn lamp	
4	Light blue	Right turn lamp	
5	Blue	High beam	
7	White	Communication A	
8	Violet and gray	Communication B	
9	Black and white	Earth 485	
Legend			
			

Inspection

The instrument display is incomplete (with disordered codes). The instrument indicator is flashing abnormally. The screen becomes black.

Check the following components:

- Whether the battery level is low
- The instrument failed
- The instrument circuit connector is loose
- The combination switch circuit is short
- The instrument circuit is short due to water entrance (it can be dried with an air blower through the vent hole under the instrument panel)

Power lock

1. The main lock is closed (OFF)
2. The main lock is started (ON)
3. The seat cask is opened (OPEN)
4. The steering handle is locked (LOCK)

Inspection

Remove the following components:

- Front panel
- Right vehicle body panel


Disconnect the ignition switch 2P connector.

Harness interface			
Component name	Ignition switch	Interface number	J11-B
Interface definition			
PIN	Color	Definition	
1	Red	Power cord (60V)	
2	Pink	Ignition switch (KEY)	
Legend			

Component interface			
Component name	Ignition switch	Interface number	J11-A
Interface definition			
PIN	Color	Definition	Wire length
1	Red	Power cord (60V)	15cm
2	Pink	Ignition switch (KEY)	
Legend			

Check the connectivity of each switch position at the ignition switch connector.

The connectivity between circuits of different colors should be available.

	BAT1	BAT2
ON		
OFF		
Color	R/B	R

Left and right combination switches/accelerator handle

Left combination switch

High/low beam switch

Turn signal lamp switch

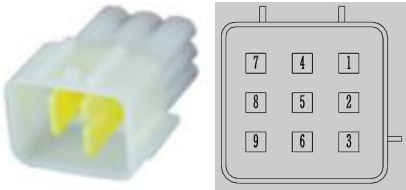
Horn switch

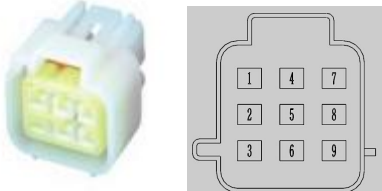
Rear brake

Left handle



Harness interface

Component name	Left combination switch	Interface number	J1-B
Interface definition			
PIN	Color	Definition	
1	Blue	High beam	
2	White	Low beam	
3	Blue and white	Headlight switch	
4	Yellow	Left turn signal lamp	
5	Light blue	Right turn signal lamp	
6	Gray	Flasher	
7	Dark green	Horn	
8	Red and white	Power cord (12V)	
Legend			
			

Component interface			
Component name	Left combination switch	Interface number	J1-A
Interface definition			
PIN	Color	Definition	Wire length
1	Blue	High beam	55cm
2	White	Low beam	
3	Blue and white	Headlight switch	
4	Yellow	Left turn signal lamp	
5	Light blue	Right turn signal lamp	
6	Gray	Flasher	
7	Dark green	Horn	
8	Red and white	Power cord (12V)	
Legend			
			

Inspection of the left handle switch

Check connectivity of each switch position at connectors of the dimmer switch, turn signal switch and horn switch.

The connectivity between color wires should be available.

Right combination switch

Shift regulation switch

Headlight switch

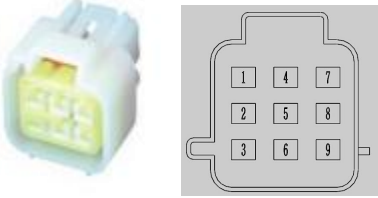
Startup switch

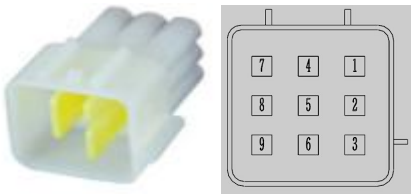
Front brake

Accelerator handle



Harness interface

Component name	Right combination switch	Interface number	J2-B
Interface definition			
PIN		Definition	
1	White and yellow	Low-speed operation	
2	White and black	Intermediate-speed operation	
3	White and blue	High-speed operation	
5	Blue and white	Headlight on switch	
6	Red and white	Power cord (12V)	
8	Black	Ground wire	
9	Brown	Startup switch	
Legend			
			

Component interface				
Component name	Right combination switch	Interface number	J2-A	
Interface definition				
PIN	Color	Definition	Wire length	
1	White and yellow	tion	55cm	
2	White and black	Intermediate-speed operation		
3	White and blue	High-speed operation		
5	Blue and white	Headlight on switch		
6	Red and white	Power cord (12V)		
8	Black	Ground wire		
9	Brown	Startup switch		
Legend				
				

Inspection of the right handle switch

Check connectivity of each switch position at connectors of the lighting switch and the startup switch.
The connectivity between color wires should be available.

Turn signal flashing relay

Inspection

Remove the front panel.

The flashing relay is above the alarm

Check the following items:

- Status of the storage battery
- Whether the bulb is burnt or there is weld missing
- Functions of the ignition switch and turn signal switch
- Connector looseness

Disconnect the turn signal relay connector from the relay.


Make the turn signal relay connector terminal (at cable side) shorted with a short wire.

Connection: Red and white/black - gray


Turn the power lock switch to ON. Check the turn signal lamp.

The signal lamp that illuminates indicates that the turn signal relay failed.

The lamp that does not illuminate indicates that the harness is broken.

Harness interface			
Component name	Flasher	Interface number	J14-B
Interface definition			
PIN	Color	Definition	
1	Red and white	Power cord (12V)	
2	Gray	Signal wire	
3	Black	Ground wire	
Legend			
 3 2 1			



Component interface			
Component name	Flasher	Interface number	J14-A
Interface definition			
PIN	Color	Definition	Wire length
1	Red and white	Power cord (12V)	10cm
2	Gray	Signal wire	
3	Black	Ground wire	
Legend			
			

Remote alarm

Removal/installation

Remove the front panel.

Remove the alarm screws and tightening adhesive at left of the front panel.

Loosen the circuit connector. Remove the alarm.

Harness interface			
Component name	Remote controller receiver	Interface number	J3-B
Interface definition			
PIN	Color	Definition	
1	Red	Power cord (60V)	
3	Black	Ground wire	
4	Red and green	DC-DC power supply	
5	Pink	ignition switch KEY	
6	Orange	Controller ACC	
7	Red and white	Power cord (12V)	
8	Yellow	Left turn signal lamp wire	
9	Light blue	Right turn signal lamp wire	
Legend			





Component interface

Component name	Remote controller receiver	Interface number	J3-A
Interface definition			
PIN	Color	Definition	Wire length
1	Red	Power cord (60V)	20cm
2	Black	Ground wire	
3	Red and green	DC-DC power supply	
4	Pink	ignition switch KEY	
5	Orange	Controller ACC	
6	Red and white	Power cord (12V)	
7	Yellow	Left turn signal lamp wire	
8	Light blue	Right turn signal lamp wire	
Legend			

Central control panel assembly

Removal/installation

Remove the front panel.

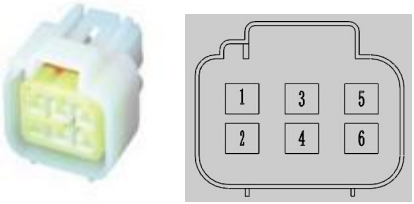
The central control panel is at the upper right side

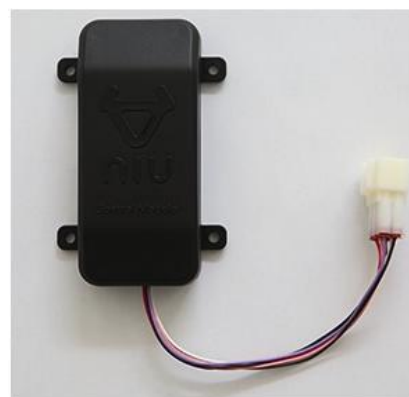
Remove 4 tightening bolts

Remove the circuit connector (the battery should be disconnected first)

Remove the central controller

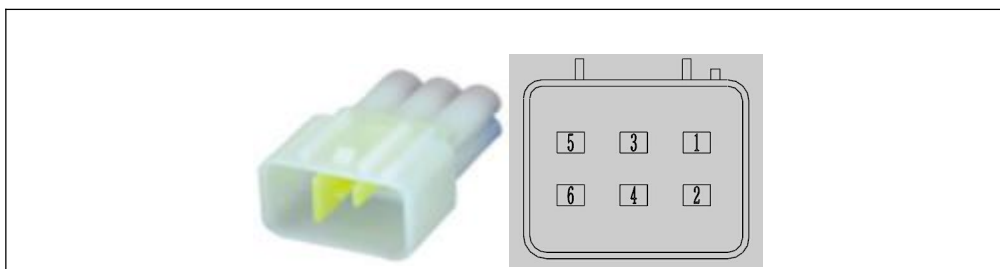
Harness interface

Component name	Central control system	Interface number	J4-B
Interface definition			
PIN	Color	Definition	
1	Red	Power cord (60V)	
2	Black	Ground wire	
3	Pink	Ignition switch (KEY)	
4	White	Communication A	
5	Violet and gray	Communication B	
6	Black and white	Earth 485	
Legend			
			



Component interface

Component name	Central control system	Interface number	J4-A
Interface definition			
PIN	Color	Definition	Wire length
1	Red	Power cord (60V)	20cm
2	Black	Ground wire	
3	Pink	Ignition switch (KEY)	
4	White	Communication A	
5	Violet and gray	Communication B	
6	Black and white	Earth 485	
Legend			



Hall cable sensor/USB conversion module/DC-DC converter

Removal/installation

Remove the front panel.

Hall cable sensor

USB conversion module

DC-DC converter

at the lower right side

Remove 3 screws on the three assembly supports, and then remove three assemblies separately.

Hall cable sensor

See the motor/controller/accelerator handle


(inspection of the Hall cable sensor)

Harness interface

Component name	USB	Interface number	J5-B
Interface definition			
PIN	Color	Definition	
1	Red	Power cord (60V)	
2	Black	Ground wire	
Legend			



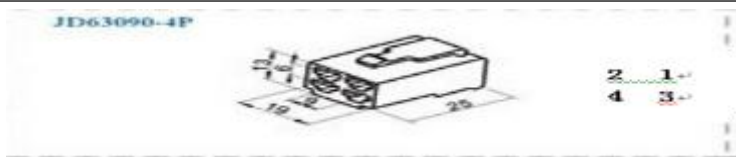
Component interface

部件名称 Component name	USB	Interface number	J5-A
Interface definition			
PIN	Color	Definition	Wire length
1	Red	Power cord (60V)	15cm
2	Black	Ground wire	
Legend			
			

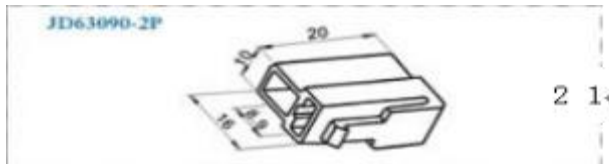
DC-DC (60V-12V) converter

Harness interface

Component name	DC-DC	Interface number	J12-B
Interface definition			
PIN	Color	Definition	
1	Red and green	60V input wire to the converter	
2	Black	Ground wire	
3	Black	Ground wire	
4	Red and white	Power cord (12V)	
Legend			

Component interface			
Component name	DC-DC	Interface number	J12-A
Interface definition			
PIN	Color	Definition	Wire length
1	Red and green	60V input wire to the converter	15cm
2	Black	Ground wire	
3	Black	Ground wire	
4	Red and white	Power cord (12V)	
Legend			
			

Charger interface

Harness interface			
Component name	Charger interface	Interface number	J10-B
Interface definition			
PIN	Color	Definition	
1	Red	Power cord (60V)	
2	Black	Ground wire	
Legend			
			




Component interface			
Component name	Charger interface	Interface number	J10-A
Interface definition			
PIN	Color	Definition	Wire length


1	Red	Power cord (60V)	25cm
2	Black	Ground wire	
Legend			

Cruise at a fixed speed

Harness interface

Component name	Cruise signal	Interface number	
Interface definition			
PIN	Color	Definition	
1	Gray	Cruise signal	
			

Harness interface

Component name	Cruise signal (GND)	Interface number	
Interface definition			
PIN	Color	Definition	
1	Black	Cruise signal (GND)	
			



Failure code diagnosis

Failure code diagnosis procedures.....

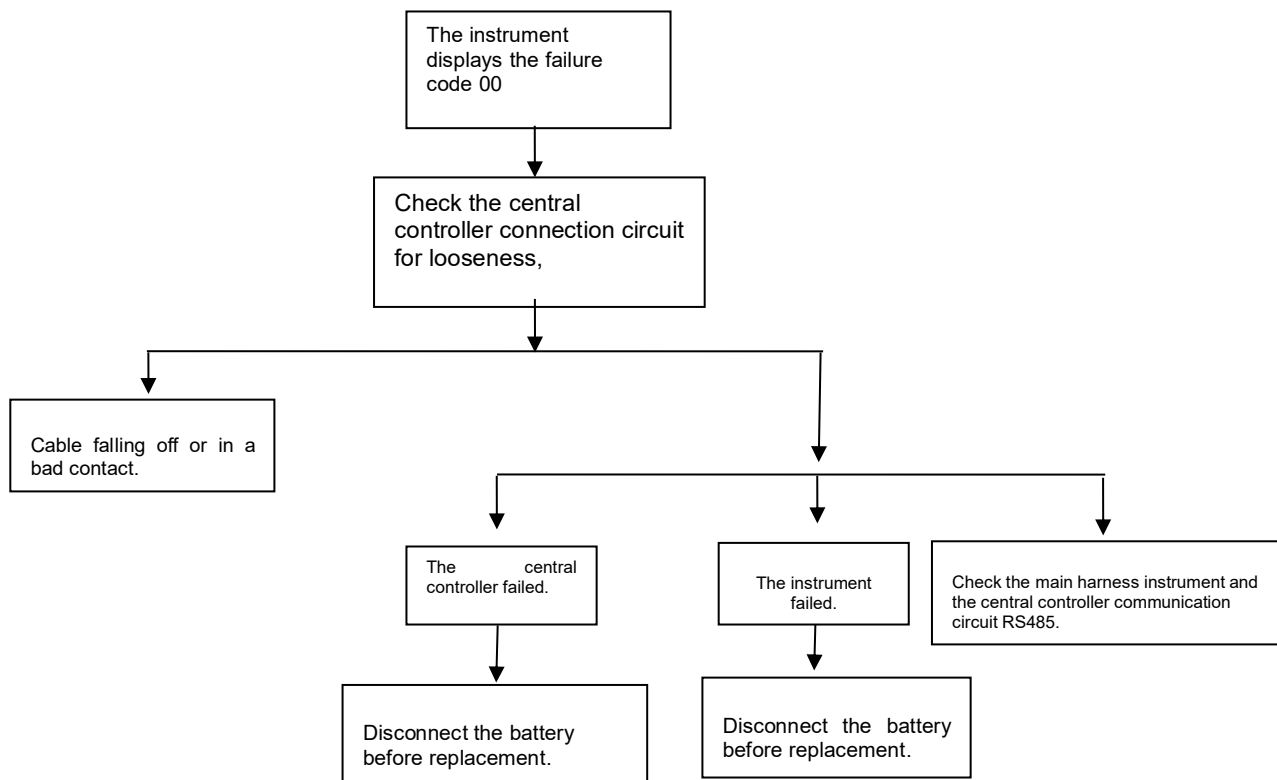
Controller or communication failure codes.....

Battery failure codes.....

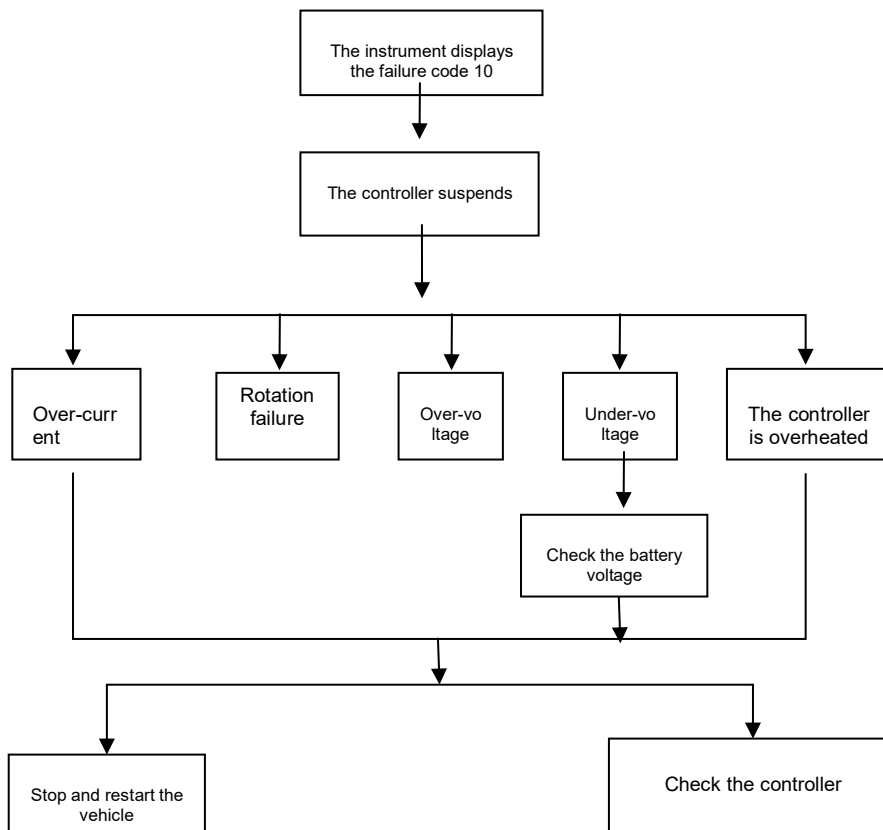
Warning codes by the central control system

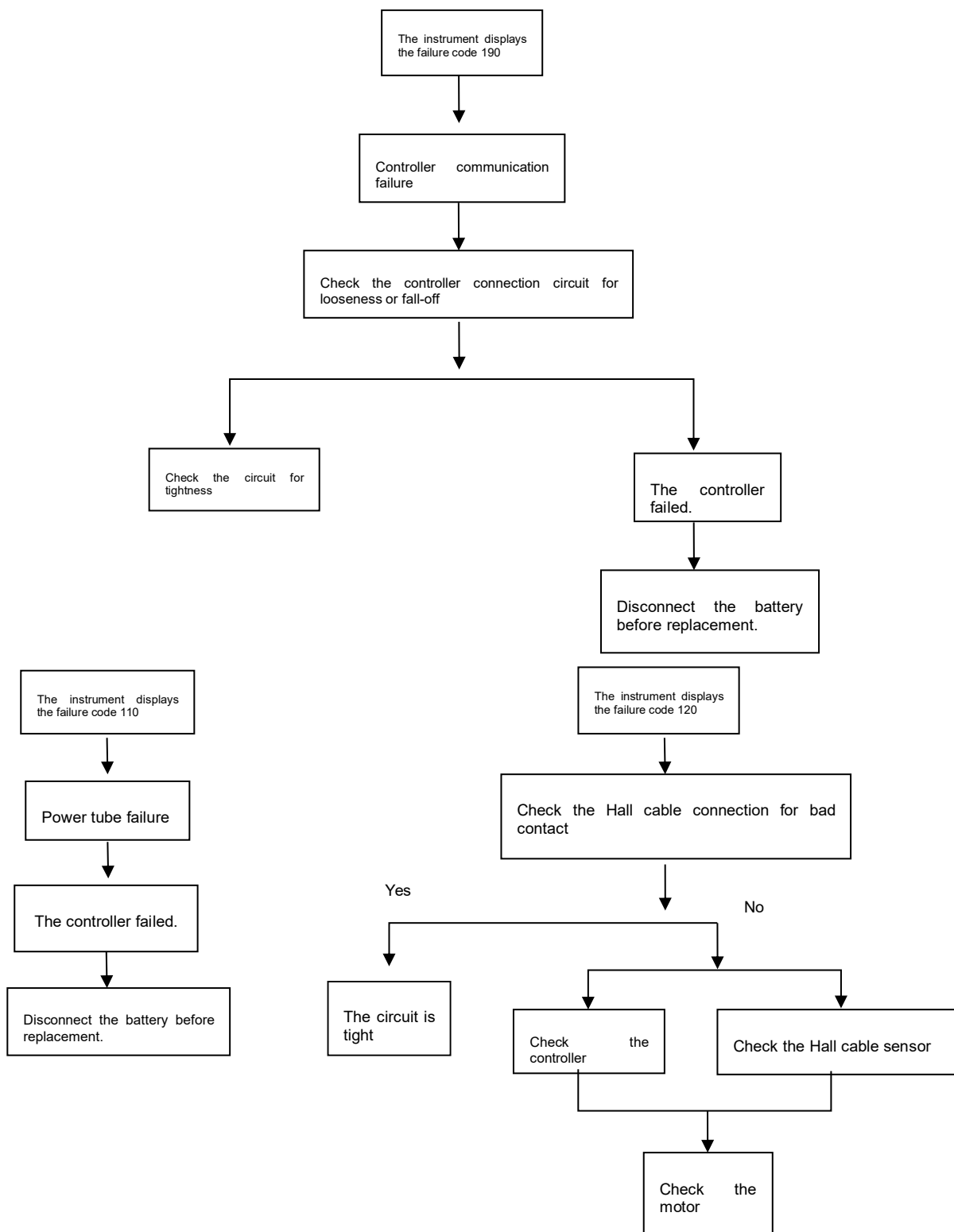
Failure code diagnosis

Failure code diagnosis procedures



Controller or communication failure codes





The instrument displays the failure code 111	Driver verification failure	Make sure that the alarm has been unlocked. Close and turn on the ignition switch.
		Check the controller wire for looseness
		Check the alarm circuit
		Battery BMS communication failure
		Replace the central controller
		Replace the instrument
		Replace the Hall cable
	Replace the 60V-12V DC converter	
Circuit failure	Replace the main harness	

Battery failure codes

The instrument displays the failure code 30	Battery over-charging	Stop charging. Start discharging if it is normal.
	Low-temperature battery protection (-20 °C)	Restore the temperature
	The BMS temperature detection circuit is loose	Replace the battery
The instrument displays the failure code 31	The charging is under over-current	Stop charging. Check the charger for damages.
The instrument displays the failure code 130	Battery over-discharging	Stop riding, and charge the battery.
	Charging failure	Make activation with the battery restorer
The instrument displays the failure code 131	The discharging is under over-current	Stop and restart the scooter
The instrument displays the failure code 132	Battery overheat	Stop riding and wait for the battery cool down
The instrument displays the failure code 191	BMS communication failure	BMS has not returned the data or has provided the incorrect data for 3 consecutive times

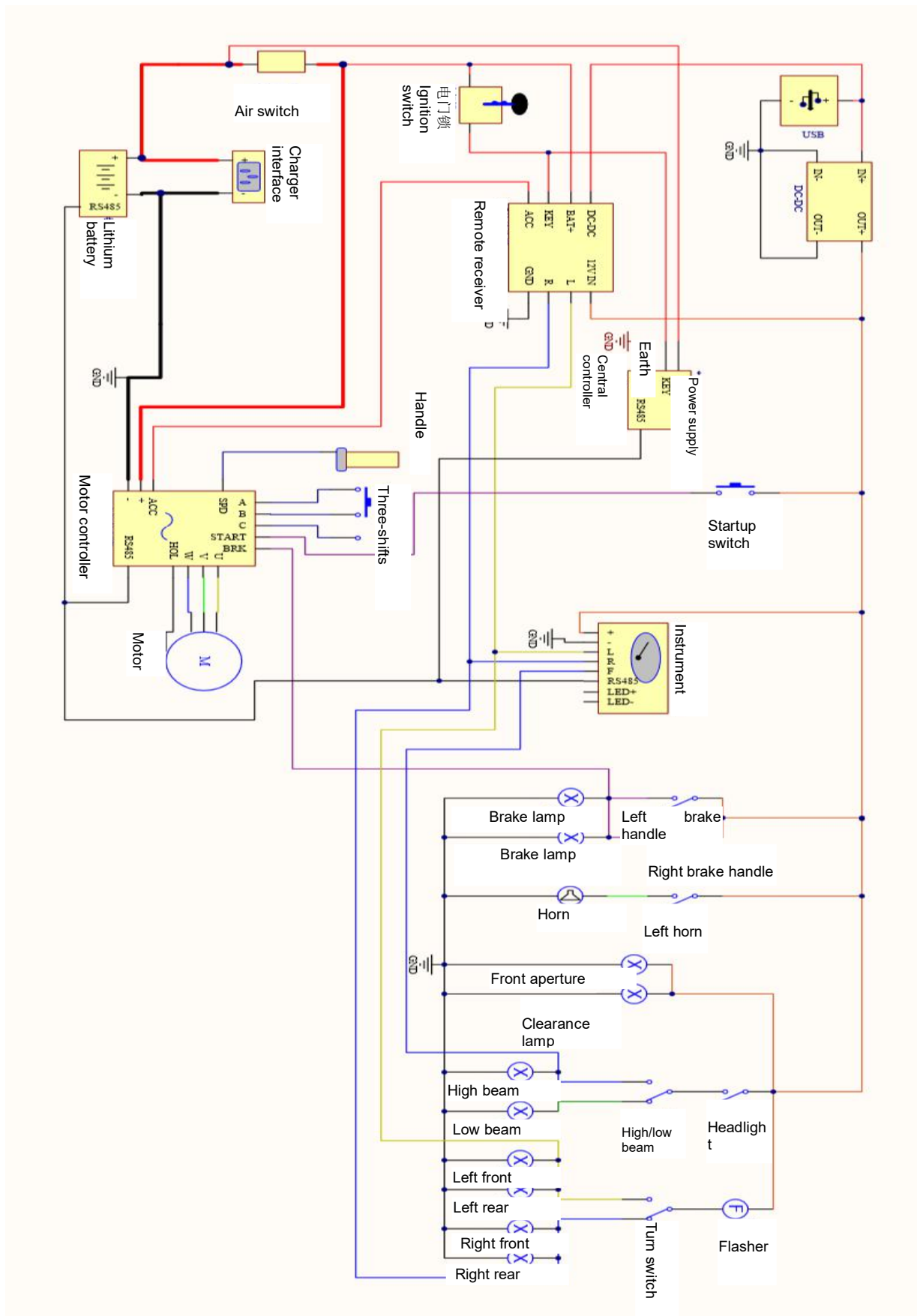
Warning codes by the central control system

The instrument displays the failure code 60 (identification of the SIM card failed)

Disconnect the battery before replacement of the central controller assembly

60	SIM808	SIM card identification failed	Check the central controller assembly
61		The SIM card is overdue	The flow volume in the first year is free of charge with timely due payment.
62		GPS failure	Check the central controller assembly

Circuit diagram





niu.com