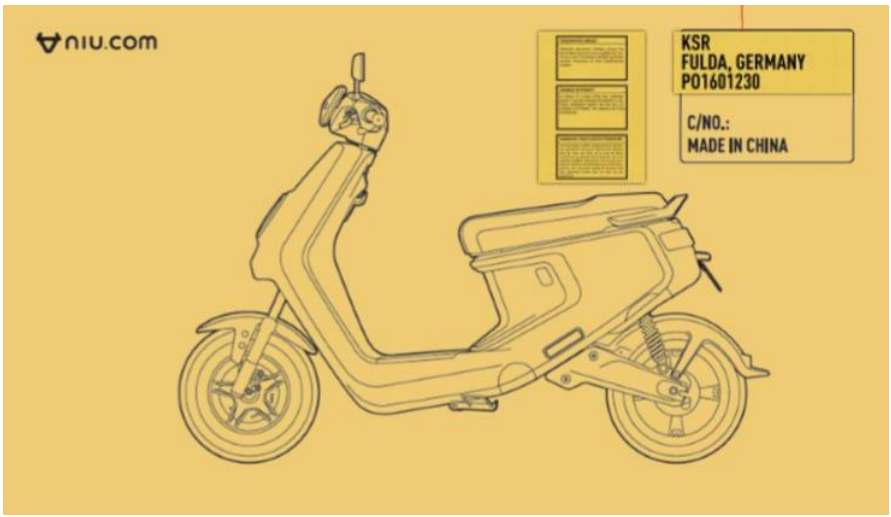
M+ Scooter

Service Manual

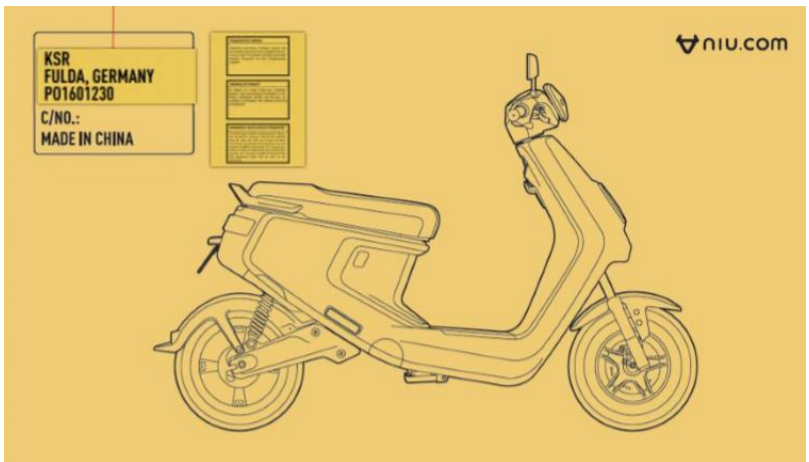
Jiangsu Niu Electric Technology Co. Ltd

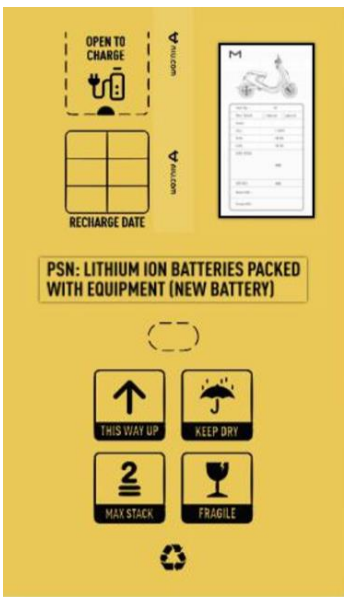
M+ Lite(48V 800W): 25km/h 45km/h
M+ Sport(48V 1200W):25km/h 45km/h

RED WHITE BLUE SILVER



PSN: LITHIUM ION BATTERIES PACKED WITH EQUIPMENT (NEW BATTERY)





V1.1.0

Foreword

Key points in maintenance of Niu M+ 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.

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 highly 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 fluid 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

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.

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.

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

- Vehicle serial number (SN) is in the user manual

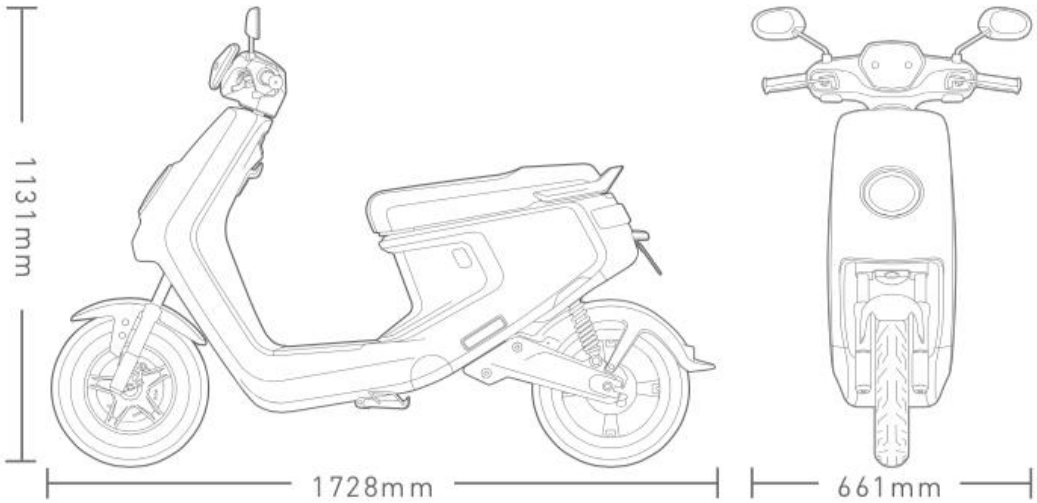
- The scooter frame identification code (VIN) is made on the rear frame at rear seat cask.

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

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

Overall specifications

Technical Parameters



Key Features			
Product Weight	72Kg	Gradeability	Dynamic: 15°
Rated Voltage	48V	Maximum Designed Speed	45km/h 25km/h
Maximum Load	149Kg	Braking Distance	≤4.5m (30km/h)
Designed Capacity		1 or 2 Persons	

Frame	
Front Damper	Oil Damping Direct Acting Shock Absorber
Rear Damper	Oil Damping Direct Acting Shock Absorber
Front Tyre Specifications	90/90-10 Rim: 2.15x10
Rear Tyre Specifications	90/90-10 Rim: 2.15x10
Front Brake Mode	180 mm Dual-Piston Hydraulic Disk Brake
Rear Brake Mode	180 mm Hydraulic Disk Brake
Minimum Ground Clearance	126mm
Seat Height	710mm

Specifications of the power system

Power System		
	M+ Sport	M+ Lite
Motor	Tailored Motor by Bosch GmbH	Tailored Motor by Bosch GmbH
Motor Control Mode	FOC Vector Control	FOC Vector Control
Motor Rated Power	1200W	800W
Motor Maximum Power	1600W	1400W
FOC Controller Max. Current	40A	40A

Specifications of the battery/charger system

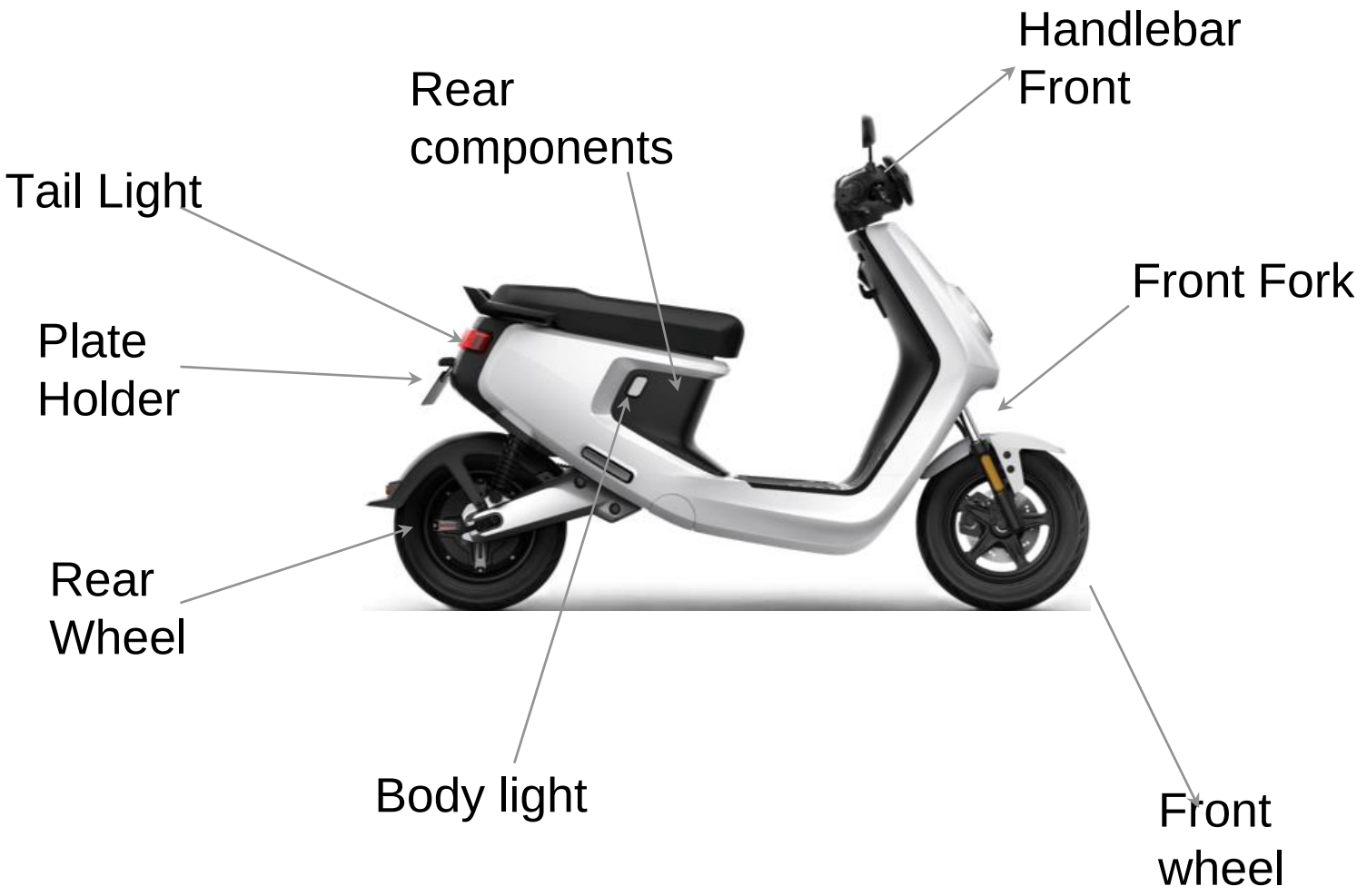
Item		Specifications
Charger	Rated output voltage	54.6V
	Rated output current	4.0±10%A/5.2±10%A

Battery System		
	M+ Sport	M+ Lite
Voltage	48V	48V
Capacity	42Ah	31Ah
Standard Charging Current	5A	5A
Maximum Discharging Current	40A	40A

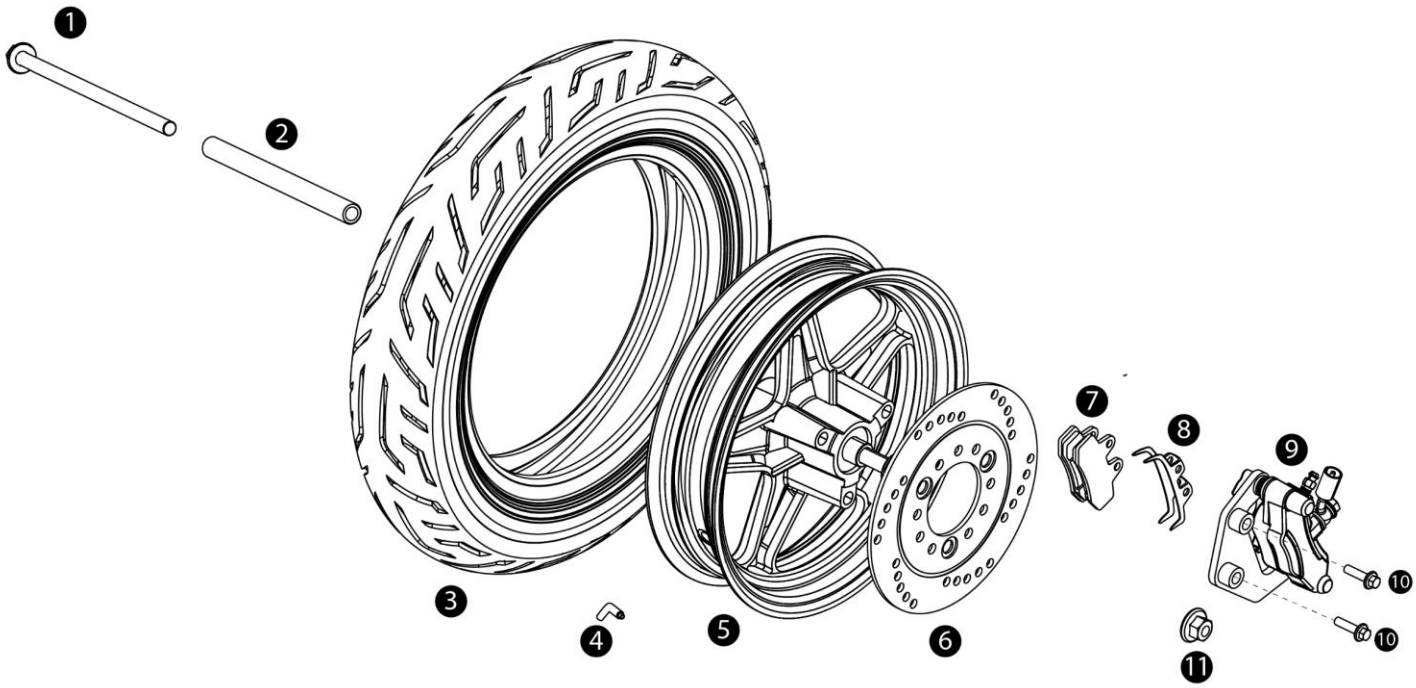
Specifications of the Electrical System

Electrical System	
Headlight	12V LED
Turn Indicator	12V LED
Taillight	12V LED
Brake Light	12V LED
Meter Panel	12V LCD
Central Control Unit	12V
USB Charging	5V/1A

Part Names

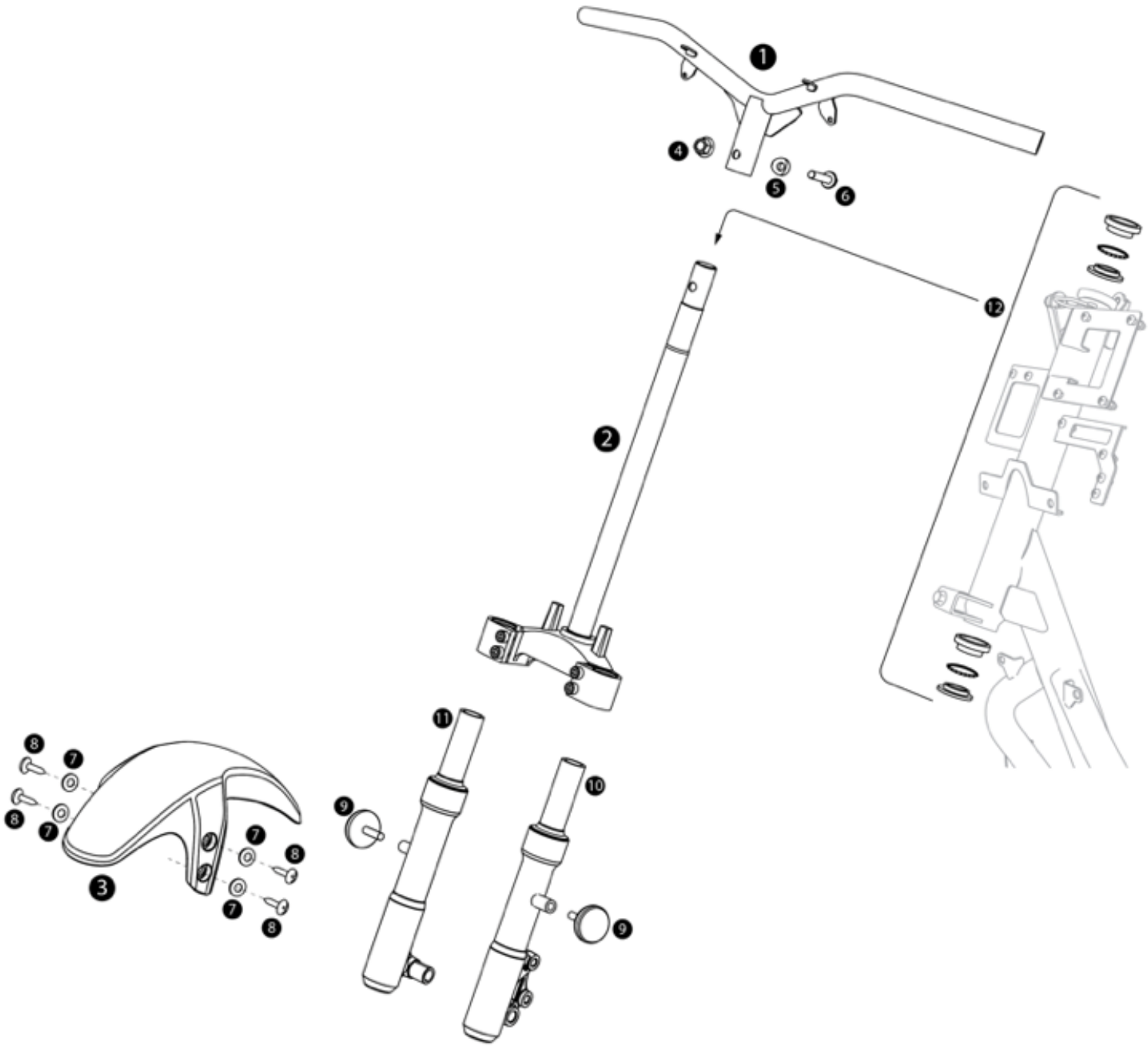

Handlebar
Front
Rear
components
Tail Light
Front Fork
Plate
Holder
Rear
Wheel
Body light
Front
wheel

Front Wheel



1. M+ Front Wheel Axle 2. M+ Front Wheel Axle Sleeve 3. M+ Tyre 4.Front Tyre Valve 5. M+ Front Wheel 6.M+ Front Disc Brake Disc 7. M+ Front Disc Brake Pad Set 8. M+ Front Disc Brake Spring 9. M+ Front Disc Brake Lower Fluid Pump
10. Hexagon Flange Bolt 11. Hexagon Locking Nut

Front Fork

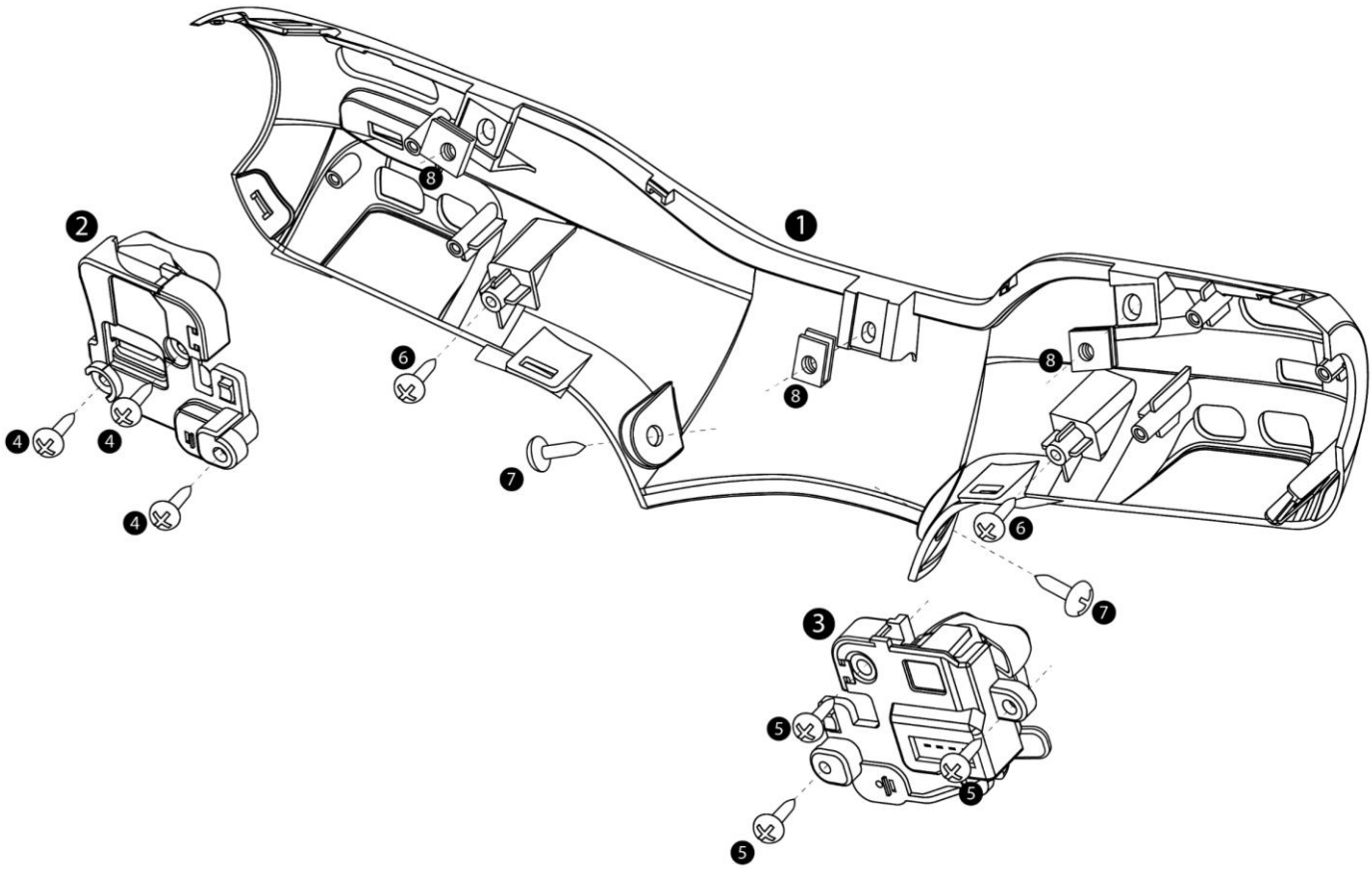


1. M+ Steering Handlebar 2. M+ Steering column（without shock absorber） 3. M+ Front Fender 4. Hexagon Flange Self-locking Nut 5. Locking block 6. Hexagon Flange Bolt 7. Front Fender Rubber Washer 8. Cross Recessed Medium Pan Head Bolt 9. M+ Reflectors(Left&Right) 10. Front shock absorber（left）11. Front shock absorber（right）12. M+ Steering Bearing

Handlebar Front

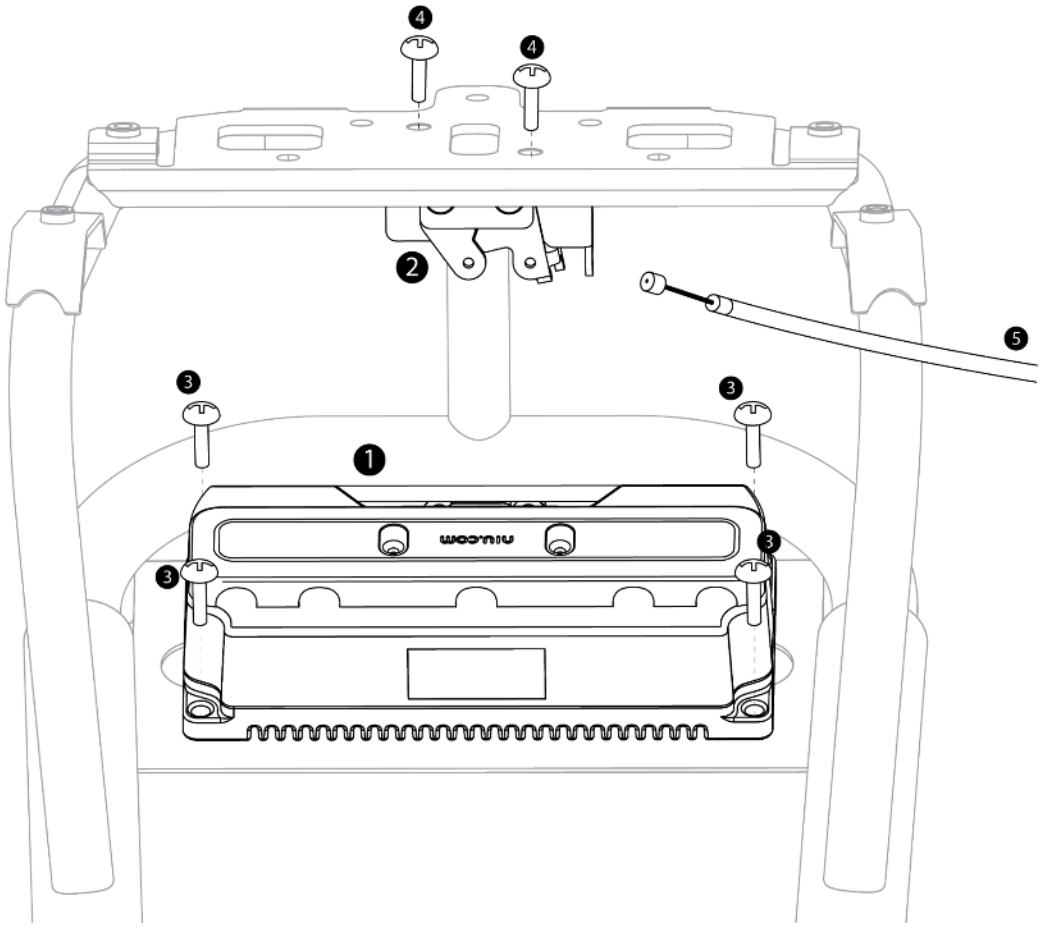
1. M+ Wind Shield 2. M+ Rear View Mirror (Left) 3. M+ Rear View Mirror (Right) 4. M+ Handle Grip(Left) 5. M+ Rear Drum Brake Lever 6. M+ Handlebar Left Cover 7. M+ Handlebar Front Cover 8. M+ Handlebar Right Cover 9. M+ Front Disc Brake Lever 10. M+ Front Disc Brake Top Fluid Reservoir 11. M+ Handle Grip(Right Twist Grip) 12. M+ Left Turning Light Assembly 13. M+ Right Turning Light Assembly 22. Front brake switch

Handlebar Rear



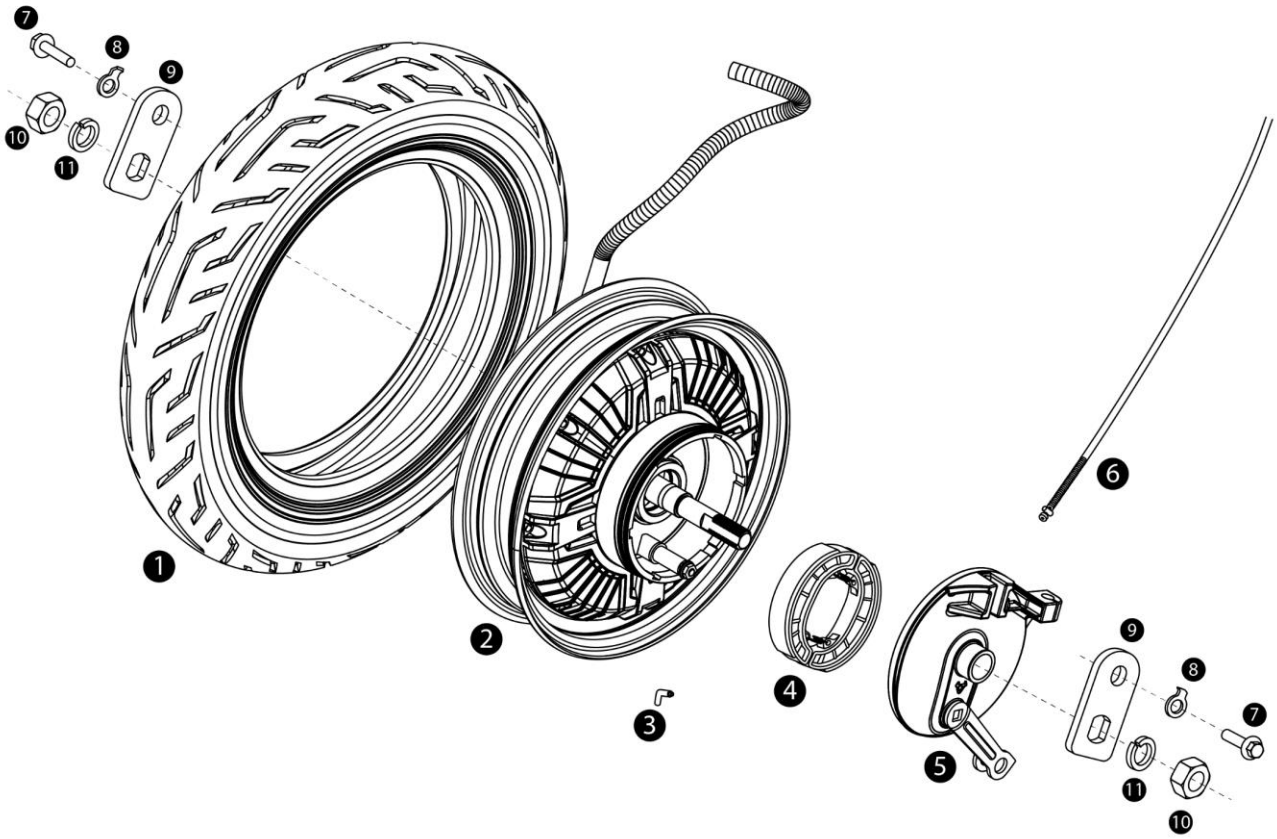
1. M+ Handlebar Rear Cover 2. M+ Left Combination Switch 3. M+ Right Combination Switch

Rear Components



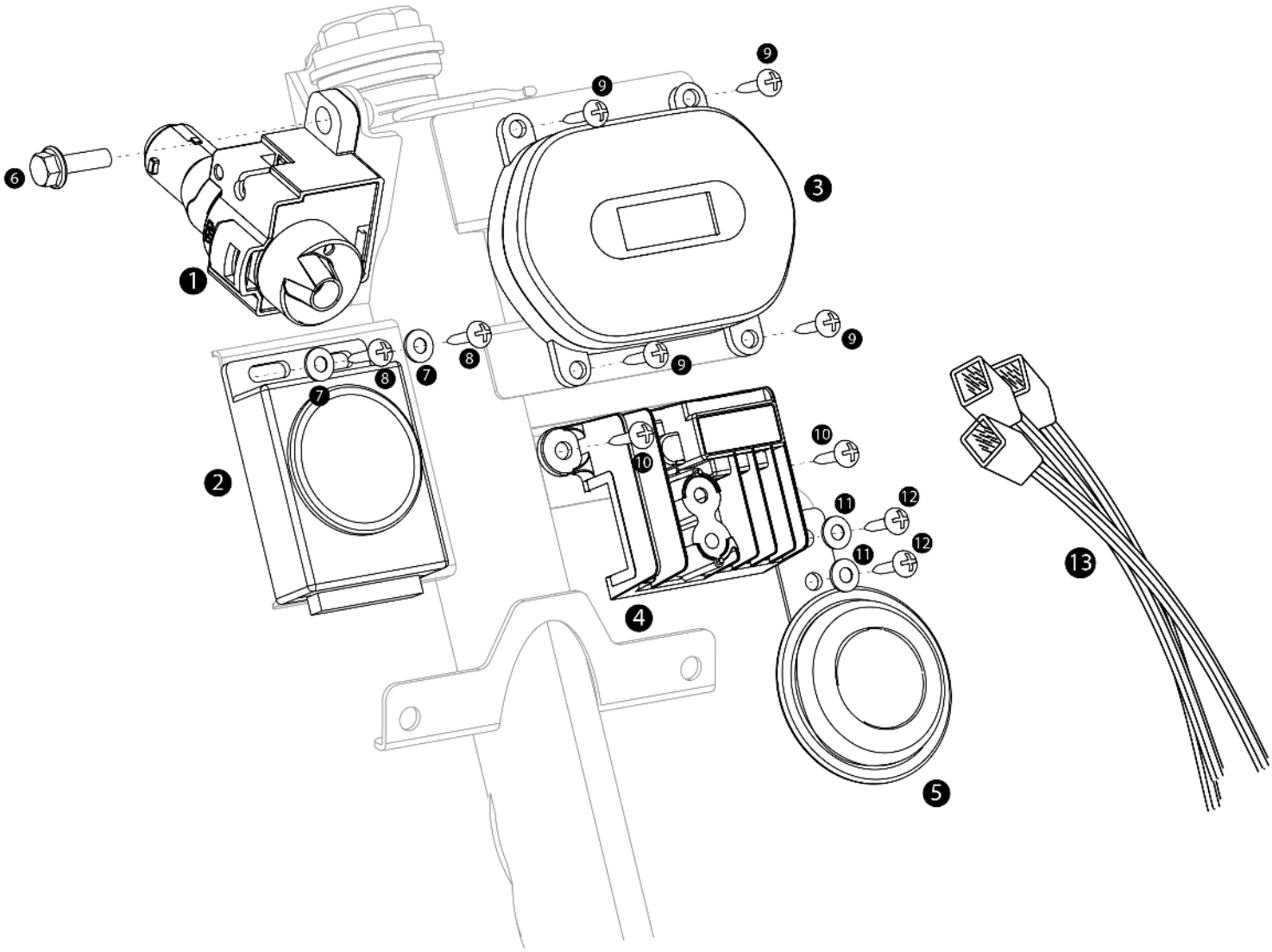
1. M+ FOC Controller 2. Saddle Lock 5.M+ Saddle Lock Cable

Rear Wheel



1. M+ Tyre 2. M+ Motor 3.Rear Tyre Valve 4.M+ Rear Brake Pad Set 5.M+ Rear Drum Brake Cover 6.M+ Rear Drum Brake Cable

Electronic Components



1. M+ Power Lock Set 2. M+ Alarm Set(with remotes) 3. M+ ECU 4. M+ DC-DC Converter 5.Horn 13. M+ Harness Assembly

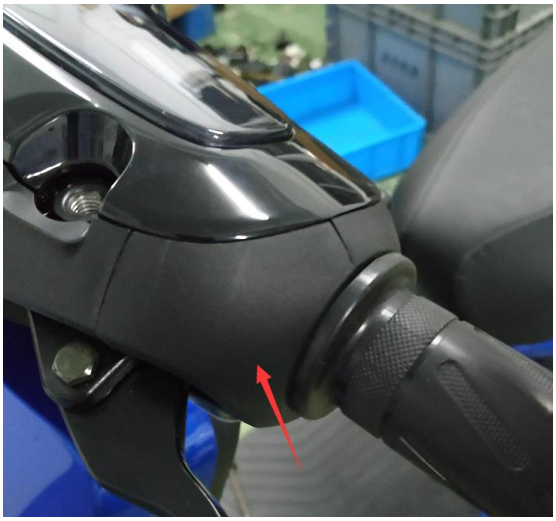
Parts Removal and Installation Procedure

Procedures for removal and installation of scooter body panels are described in this section.
The ignition switch must be turned to OFF before disconnection or connection of electric units, when the storage battery has been installed onto the scooter.

Note

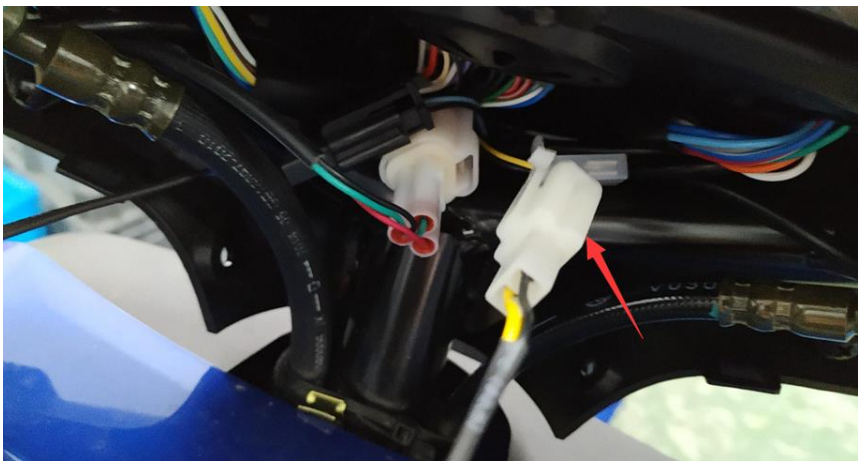
- Do not damage scooter body coverages in disassembling/assembling.
- Do not damage hooks and claws on scooter body coverages in disassembling/assembling.
- Align the embedded panels and covers on scooter coverages with their respective grooves.
- Hooks and claws at various sections should be installed properly during assembly.

Handle bar front cover



1-Remove this rear part
of left handle grip first

2-Unscrew the 4 screws

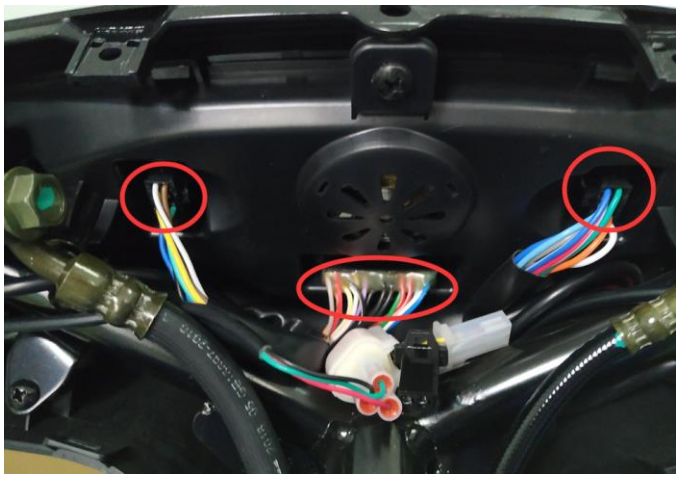


3-Disconnect the left and right direction
indicator connectors- to remove the
handle bar front cover from right to left

Direction indicators

Mount: Install it from left side to right side.
Make sure the buckles match well especially
the bottom two buckles.
Then check if the cover stuck the
direction indicator

Dashboard Assembly



1-Right combination switch connector-dashboard connector-Left combination switch

2-Remove the four screws

Dismount:Disconnect the dashboard connector,left and right combination switch and Unscrew the 4 screws.
After that,
Both of the combination switch and
handlebar rear cover
can be removed.

Mount: Install it from left side to right side.
Make sure the buckles match well especially the bottom two buckles.
Then check if the cover stuck the
direction indicator.

Front Panel

Panel fixed screws

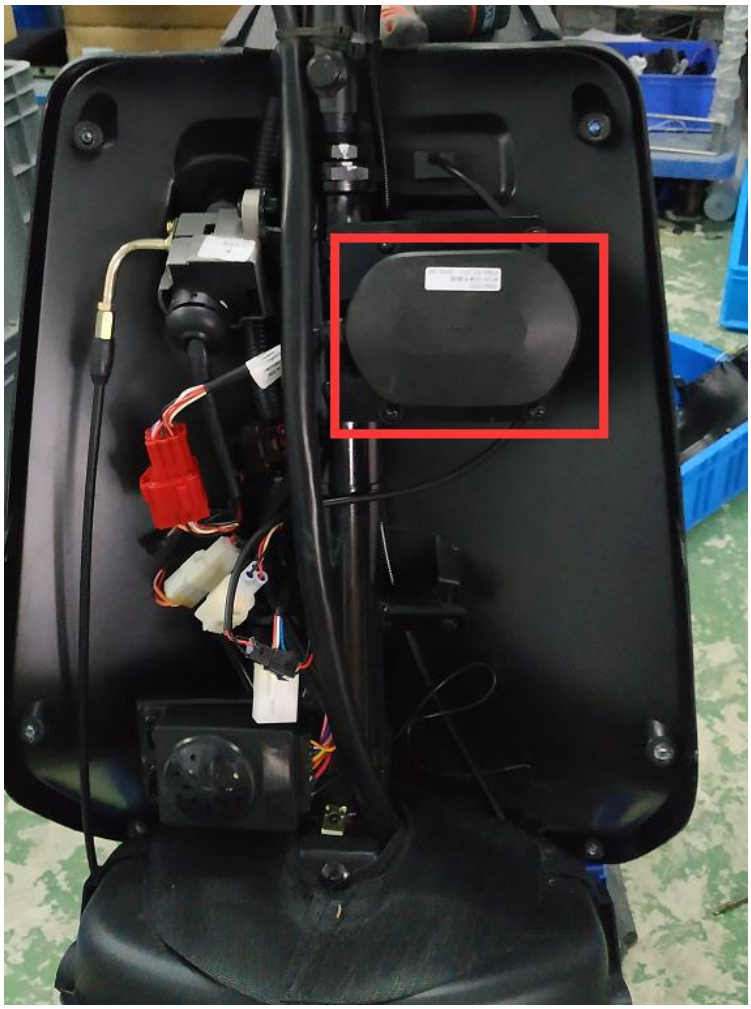
Panel bottom fixed screws

Zoom up-Detail

Dismount:Unscrew the 10 screws to remove the Front Panel.

Mount:Install on the opposite way. Please check the tapping clip plate if miss before assembly

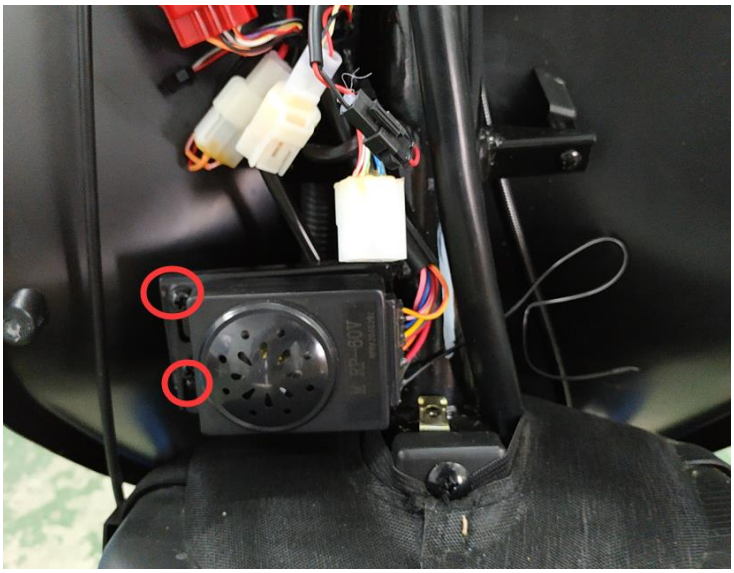
ECU



Dismount: Disconnect ECU RED connector and unscrew the 4 screws to
remove the ECU.

Mount:Install on the opposite way.

Alarm



Dismount:Disconnect the alarm connector
And unscrew the 2 screws to
remove the alarm.

Mount:Install on the opposite way.

Head Lamp

Dismount:Disconnect the lamp connector and
unscrew the 4s crews to
remove the head lamp.

Mount:Install on the opposite way.

Power Lock with handlebar lock

Dismount:
Disconnect the power lock connector and
unscrew the 2hexagonal screws
remove the power lock.

Mount: Install on the opposite way.

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Front wheel cover front

2-Then remove the rest 2 screws

1-Unscrew the central screw and remove the dustproof cloth

Dismount:
Unscrew the 3 screws to
remove the front wheel cover front

Mount:Install on the opposite way.

Footrest

Dismount:
Remove the 4 rubber plugs and unscrew the 4 hexagon flange bolts to remove the footrest.

Mount:Install on the opposite way.

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Front central panel

Glove compartment

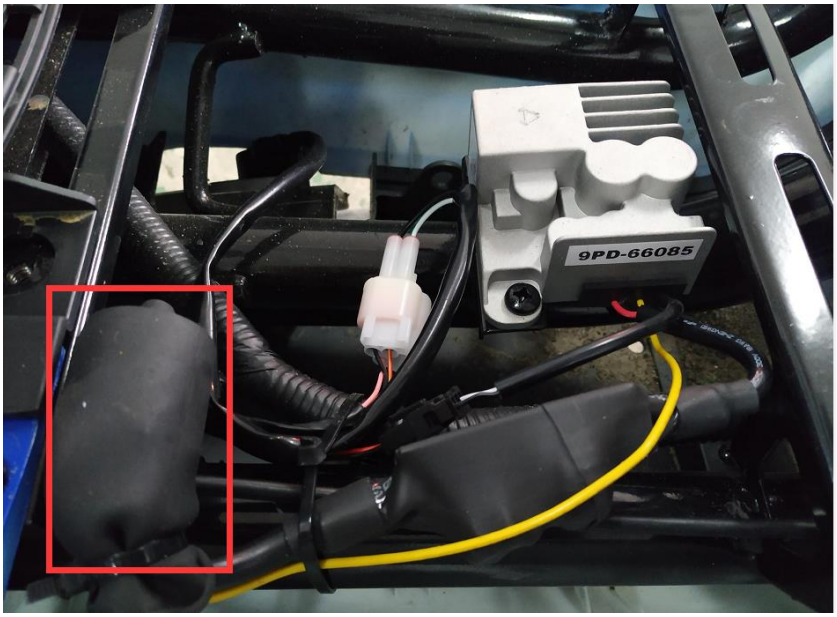
Front panel fixed screws

Front panel fixed screws

Dismount:
Unscrew 3 screws to remove glove compartment and hook.And unscrew the rest 6 screws to remove the front central panel.

Mount:Install on the opposite way.

DC-DC



Dismount: Get rid of the rubber cover to connect the connector and unscrew the 2 screws to remove the DC module.

Mount:Install on the opposite way.

Front wheel cover

Dismount:
Unscrew the 4 screws to remove the front wheel cover.

Mount:Install on the opposite way.

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Horn

Dismount:
Disconnect the 2 connectors and unscrew the 2 screws to remove the horn.

Mount:Install on the opposite way.

Saddle

Dismount:
Unscrew the 2 screws to remove the Saddle.

Mount:Install on the opposite way.

Helmet bucket

Dismount:
Unscrew the 8 screws to remove the helmet bucket. And disconnect the two connectors of charging port and communication port.

Mount:Install on the opposite way.

Handrail

PA6 Black mist

Dismount:
Unscrew the 4 screws to remove the handrail.

Mount:Install on the opposite way.

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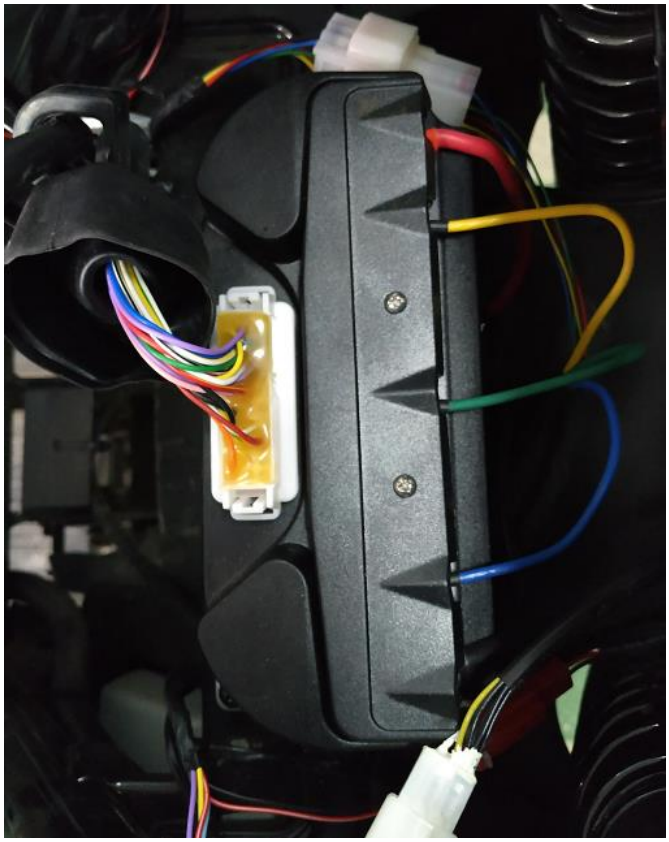
FOC Controller



Dismount:
Unplug the connector of FOC controller first and unscrew the 9 screws to remove it.

Mount:Install on the opposite way.

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Side light

Dismount:
Unscrew the 3 screws to remove it.

Mount:Install on the opposite way.And attention to use proper torque(1-2N.M) to mount the side light.

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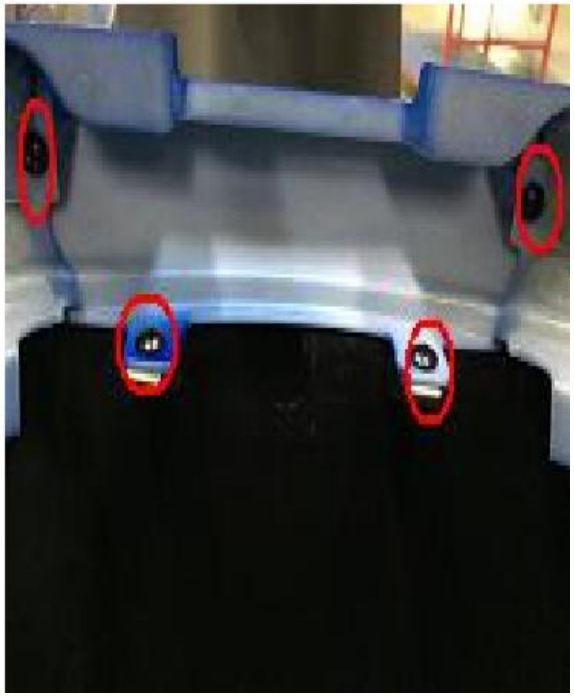
Central shock absorber

Dismount:
Unscrew the 2 bolts to remove it.

Mount:Install on the opposite way.

M+ Central Cap (ABS)

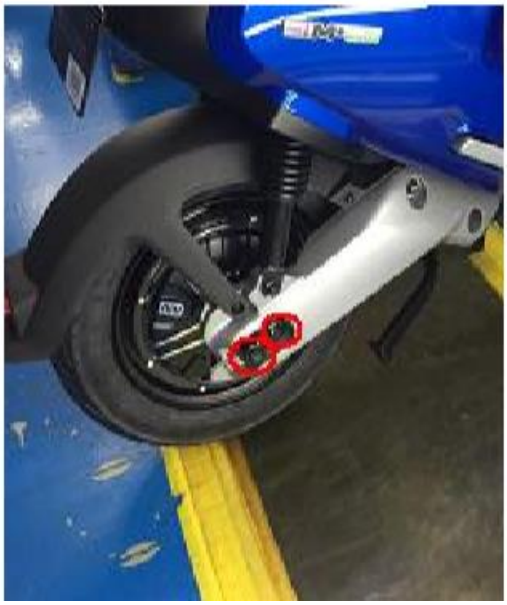


Dismount:
Unscrew the 4 screws to remove it.

Mount:Install on the opposite way.

Dismount:
Unscrew the 4 screws to remove it.(Buckle design)

Mount:Install on the opposite way.

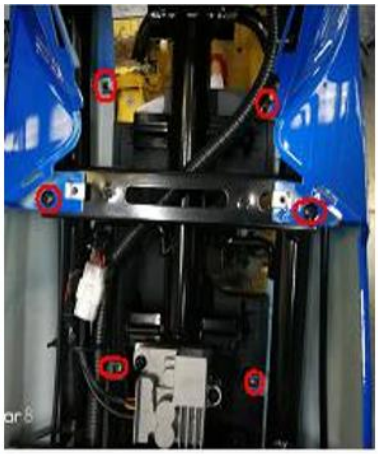


Dismount:
Unscrew the 4 fixing screws of motor and 2 screws of rear brake lower pump to remove the motor.
Mount:Install on the opposite way.

License plate light

Dismount:
Remove the connector and unscrew the 2 fixing screws
Mount: Install on the opposite way.

Left and right body

Dismount:
Unscrew the 16 related screws to move the whole left and right body.
Mount: Install on the opposite way.

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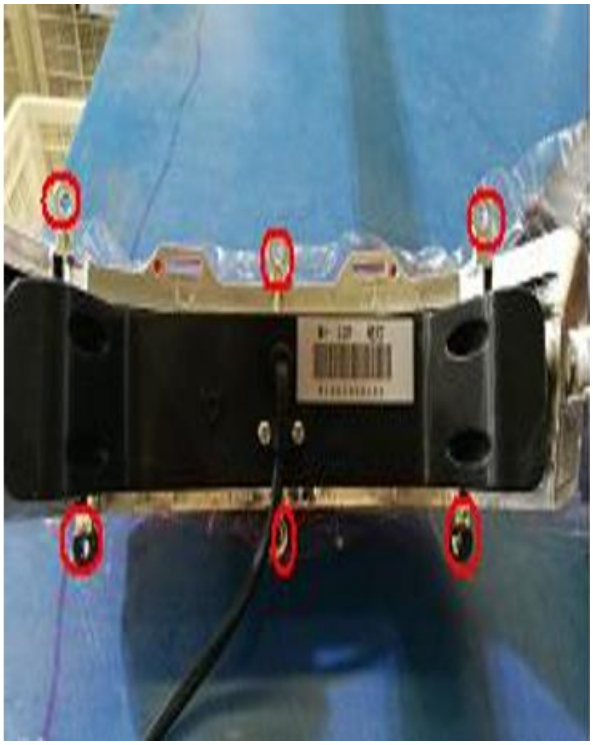
Tail light assembly



Dismount:
Unscrew the 6 related screws to move the tail light assembly.
Mount: Install on the opposite way.

Rear seat pedal

Dismount:
Unscrew the related screw to move the seat pedals.
Mount: Install on the opposite way.

M+ bottom cover

Dismount:
Unscrew the 4 related screw to move the bottom cover.
Mount: Install on the opposite way.

Rear wheel cover

Dismount:
Unscrew the 2 related screw to move the rear wheel cover.
Mount: Install on the opposite way.

Rear swing arm

Dismount:
Unscrew the related 13 screw to move the left and right rear swing arms
Mount: Install on the opposite way.

M+ side stand

Dismount:
Disconnect the connector and unscrew the related screw to move the side stand switch.
Mount: Install on the opposite way.

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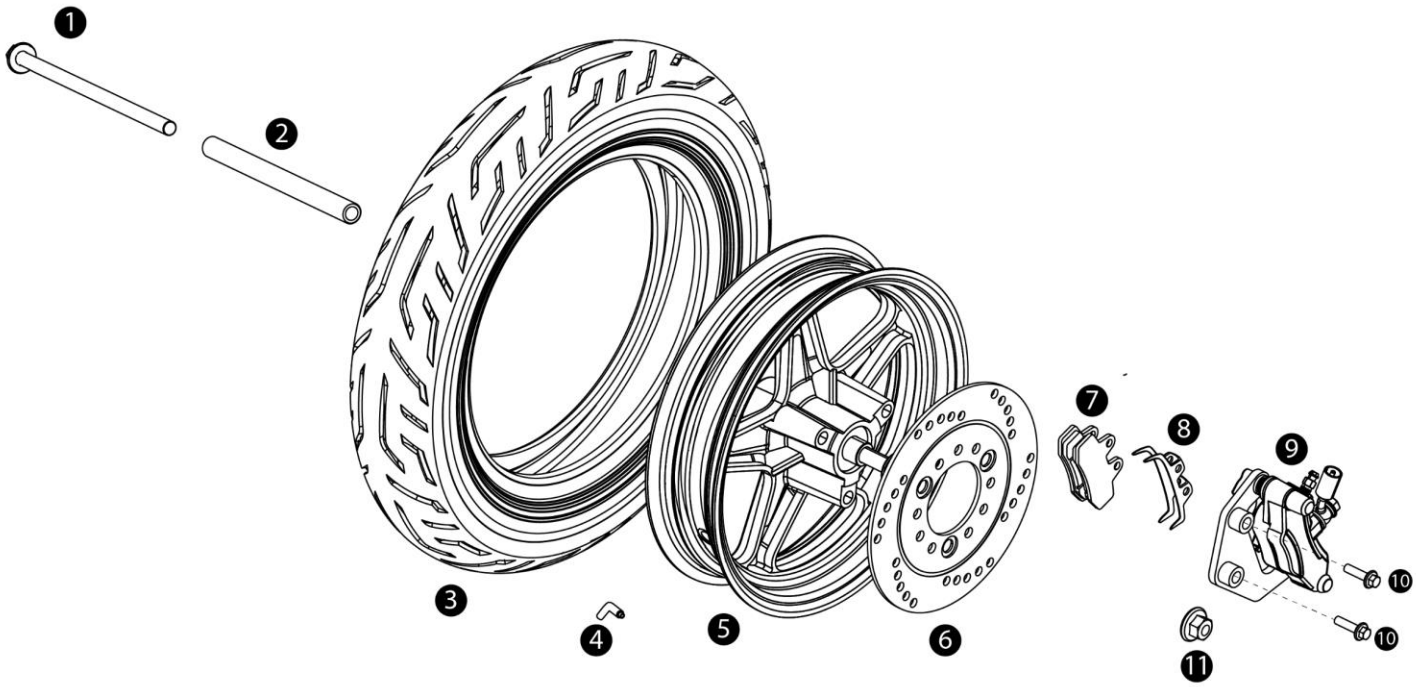
M+ Central stand (Q235)

Front Wheel



1. M+ Front Wheel Axle 2. M+ Front Wheel Axle Sleeve 3. M+ Tyre 4.Front Tyre Valve 5. M+ Front Wheel 6.M+ Front Disc Brake Disc 7. M+ Front Disc Brake Pad Set 8. M+ Front Disc Brake Spring 9. M+ Front Disc Brake Lower Fluid Pump 10. Hexagon Flange Bolt 11. Hexagon Locking Nut

Specifications of the front tire: 3.00-10 Installation torque value for screw 11 in the figure: 8Nm Installation torque value for Axle 2 in the figure: 60Nm Rim run-out limits: 2.0mm Vertical limit: 2.0mm Lateral limit: 2.0mm Deflection limit of the front axle: 0.2mm

Front Wheel

Failure diagnosis

The tire pressure is too low.
There is air leakage from the tire.
The tire pressure is insufficient.
The front axle is deflected.
The front wheel tire is deformed and the tire is deflected.
The front wheel oscillates.
The wheel 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.

Inspection

Inspection of the rim oscillation

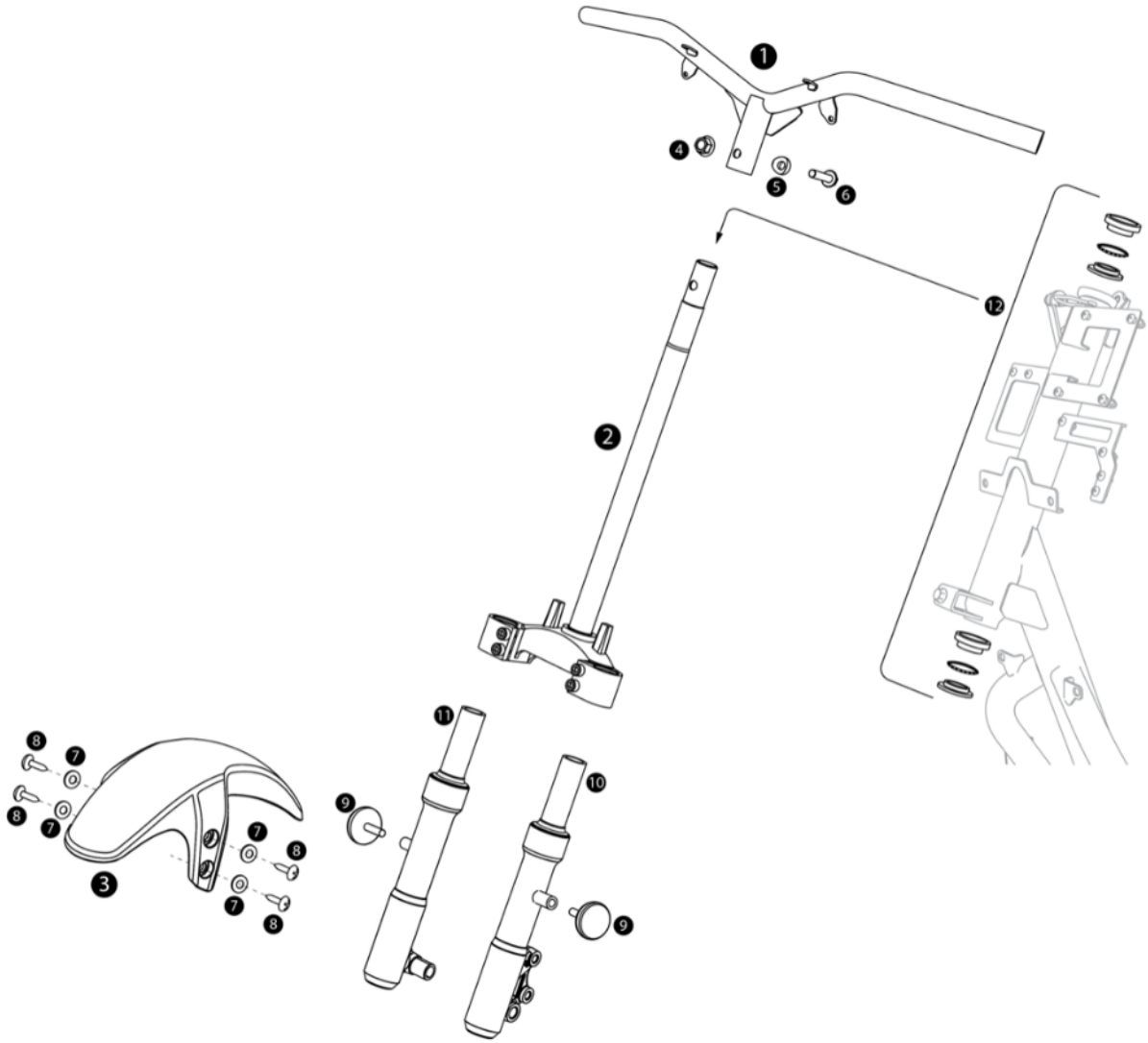
- Place the wheel on a precise support.
- Check the rim oscillation.
- Manually turn the wheel to read the oscillation value.

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.

Front Fork

Specifications of the Front Fork Installation torque value for screw 6 in the figure: 28Nm



1. M+ Steering Handlebar 2. M+ Front Fork Assembly 3. M+ Front Fender 4. Hexagon Flange Self-locking Nut (M+0*1.25 Black) 5.Locking block 6. Hexagon Flange Bolt (M+0*45*1.25 Black) 7. Front Fender Rubber Washer 9. M+ Reflectors(Left&Right) 10. Front shock absorber (left) 11. Front shock absorber (right) 12. Bearing

Front Fork

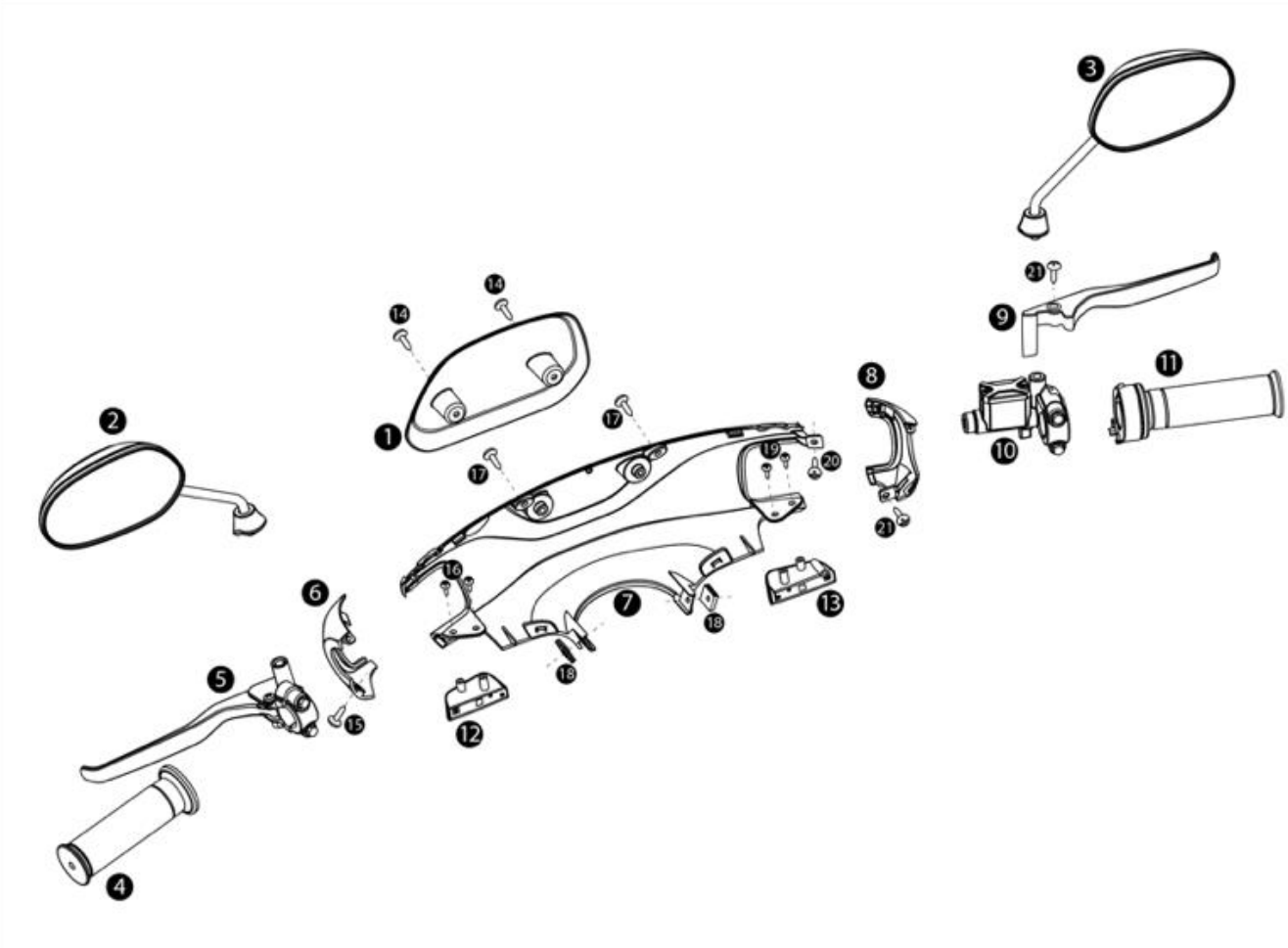
Failure diagnosis

The front fork is deflected.
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.

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.

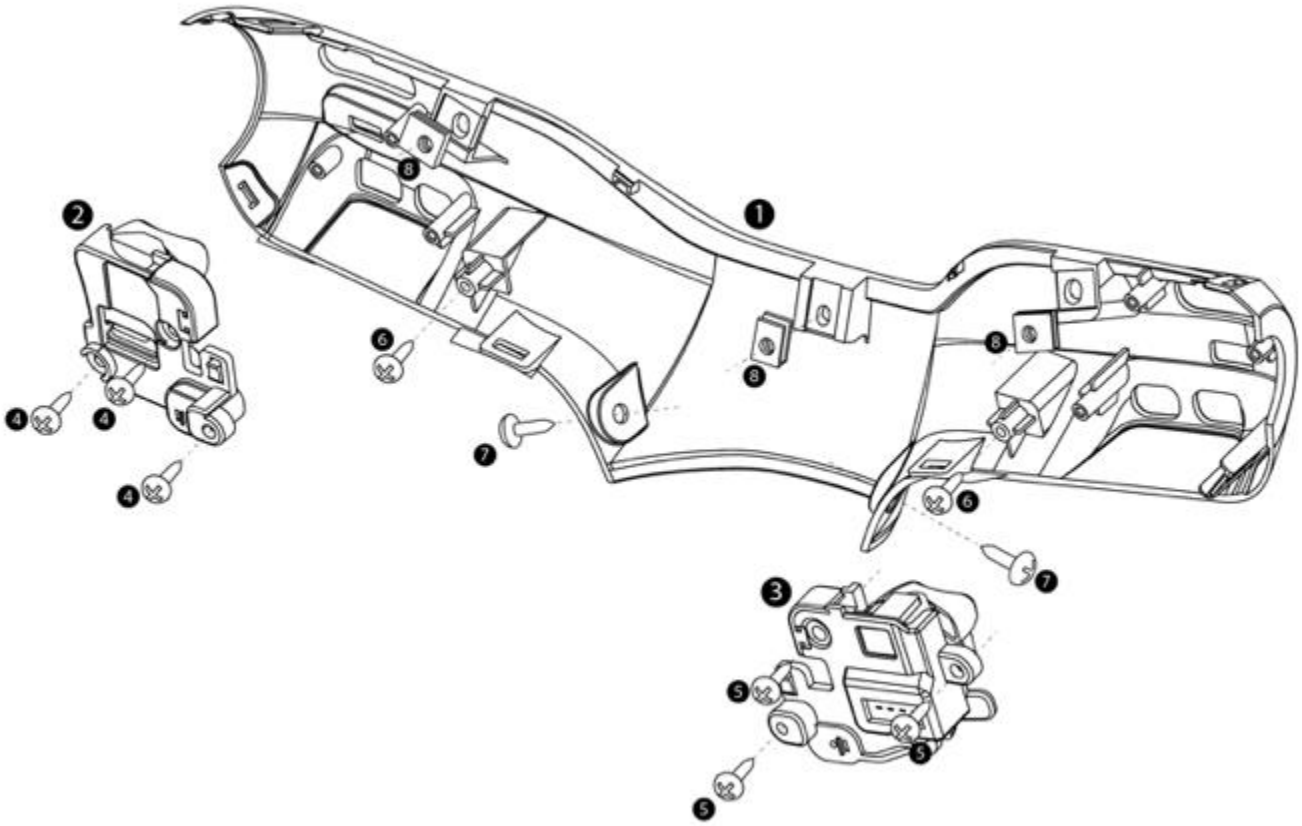
Handlebar Front



1. M+ Wind Shield 2. M+ Rear View Mirror (Left) 3. M+ Rear View Mirror (Right) 4. M+ Handle Grip(Left) 5. M+ Rear Drum Brake Lever 6. M+ Handlebar Left Cover 7. M+ Handlebar Front Cover 8. M+ Handlebar Right Cover 9. M+ Front Disc Brake Lever 10. M+ Front Disc Brake Top Fluid Reservoir 11. M+ Handle Grip(Right Twist Grip) 12. M+ Left Turning Light Assembly 13. M+ Right Turning Light Assembly

Specifications of the Steering Handlebar
Front/Rear Brake Lever free travel distance： 7-15mm
Twist Grip free travel distance： 5-10mm

Handlebar Rear



1. M+ Handlebar Rear Cover 2. M+ Left Combination Switch 3. M+ Right Combination Switch

Handlebar

Failure diagnosis

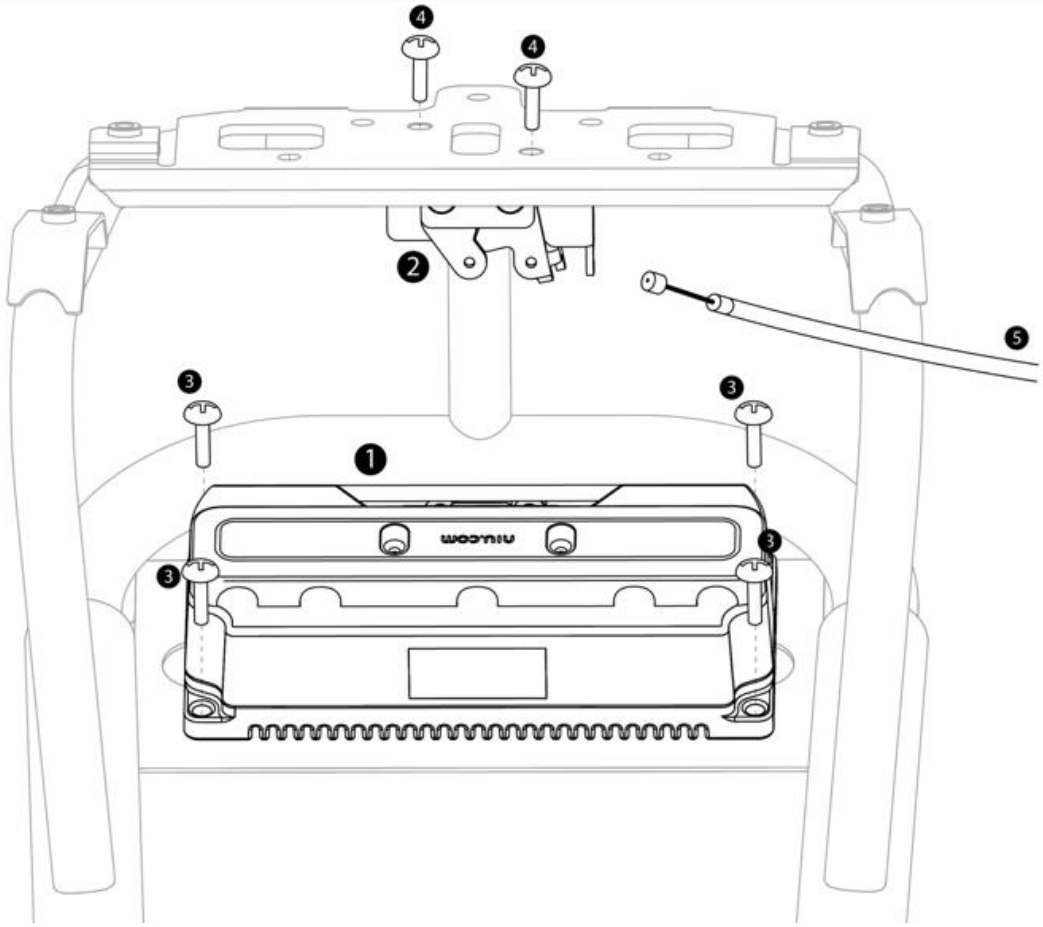
The steering handle is difficult to turn.
The steering handle bearing failed.
The steering handle bearing is damaged.
Steering is unstable
The steering handle bearing is damaged.

Disassembling

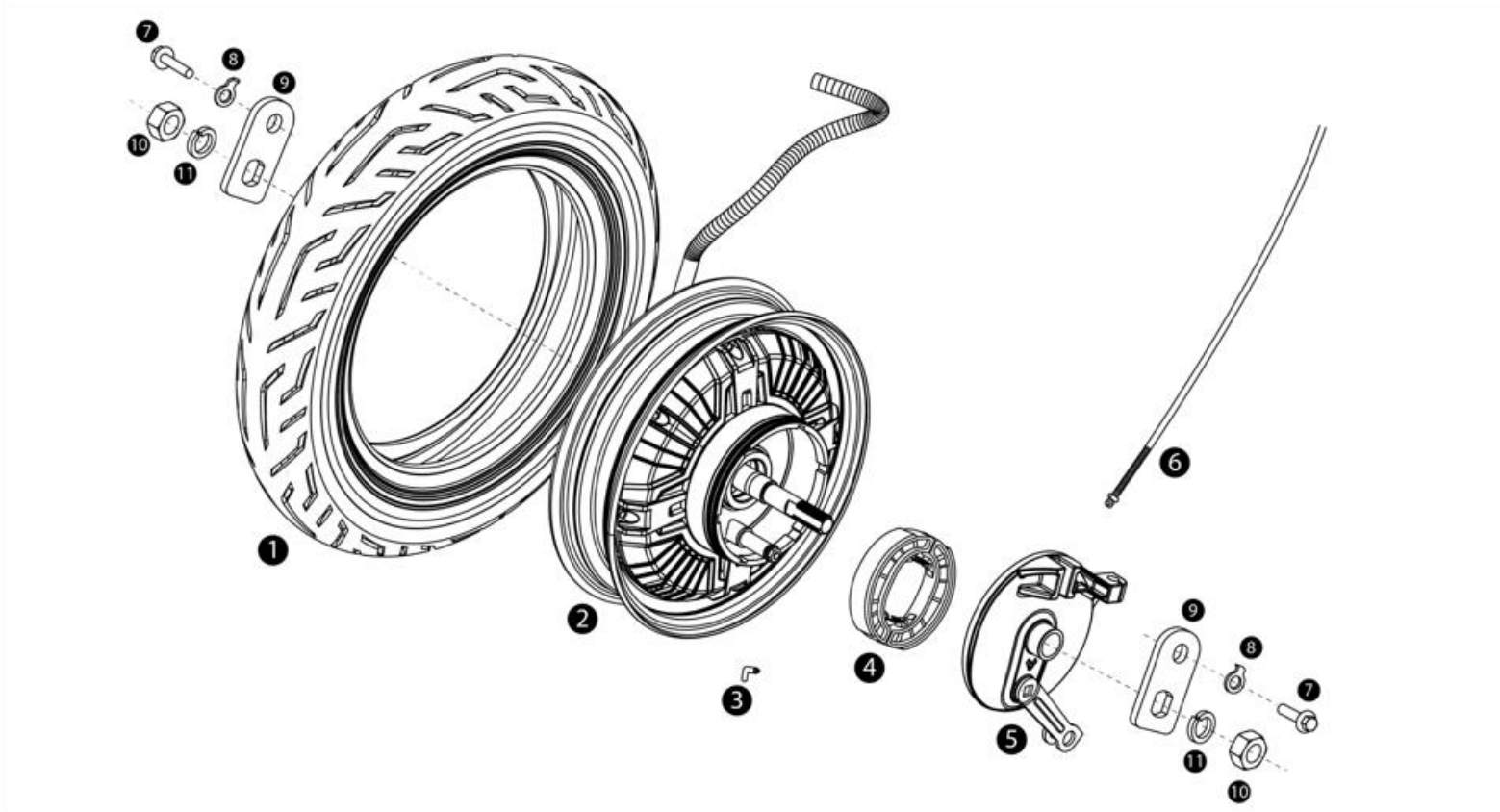
Remove the left and right rear-view mirror assemblies (5) and (11).
Remove the left and right grasp handle assemblies (1) and (12).
Remove the accelerator cable assembly (14).
Remove the left and right combination switched (3) and (13).
Remove the rear brake (4).
Remove the front brake (10).
Remove upper and lower press blocks (9) and (15) on the scooter handle.

Rear Wheel/ Rear Suspension

Rear Components



1. M+ FOC Controller 2. Saddle Lock 5. M+ Saddle Lock Cable



1. M+ Tyre 2. M+ Motor 3. Rear Tyre Valve 4. M+ Rear Brake Pad Set 5. M+ Rear Drum Brake Cover 6. M+ Rear Drum Brake Cable 7.Hexagon Flange Bolt M8*20 Black

Specifications of the Motor Installation torque value for self-locking nut 10 in the figure: 75Nm Motor oscillation value： Vertical oscillation limit： 2.0mm Lateral oscillation limit： 2.0mm

Failure diagnosis

Oscillation of the rear wheel
Deformation of the motor rim
Motor failure
Motor un-tightened
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

Disassembling Rear Absorber

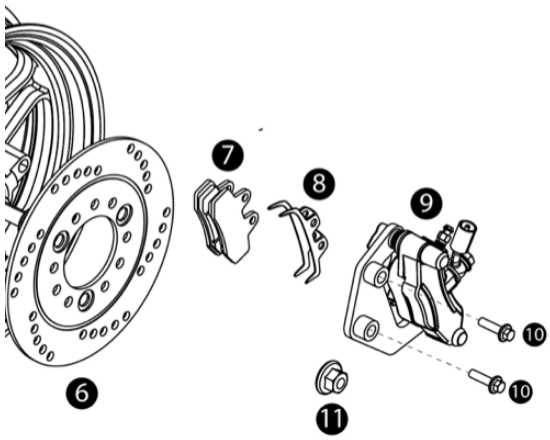
Remove the seat cushion assembly and the scooter body assembly.
Loosen tightening bolts on top of the rear shock absorber.
Loosen tightening bolts on bottom of the rear shock absorber.
Remove the rear shock absorber.

Disassembling Motor

Remove lock nuts from the motor.
Remove motor connection wires.
Remove the motor assembly.

Brake System

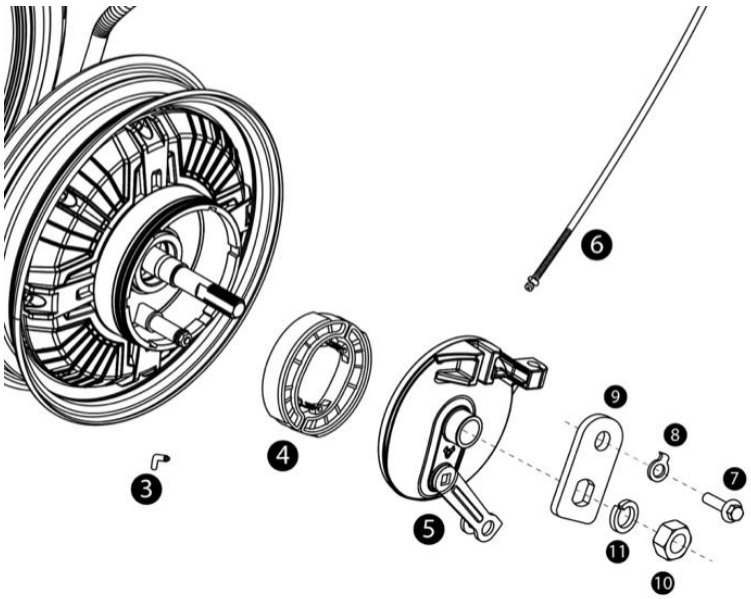
Front Disc Brake



6. M+ Front Disc Brake Disc 7.M+ Front Disc Brake Pad Set 8.M+ Front Disc Brake Spring 9. M+ Front Disc Brake Lower Fluid Pump 10.Hexagon Flange Bolt M8*35 Black 11. Hexagon Locking Nut M+2*1.25 Black

Diameter of the front brake disc: φ 1 8 0 mm Thickness of the front brake disc: 4.0mm Operating limit: 3.0mm Installation torque value for bolt 10 in the figure: 8 Nm Free travel of the front disc brake lever: 7-15mm

Rear Disk Brake



4. M+ Rear Brake Pad Set 5. M+ Rear Drum Brake Cover 6. M+ Rear Drum Brake Cable 7. Hexagon Flange Bolt (M8*20 Black)

Diameter of the rear drum disc: Φ110 mm Thickness of the rear drum disc: 3.5mm Operating limit: 2.5mm Thickness of the rear drum pad: 4.5mm Operating limit: 3.0mm Free travel of the brake handle: 7-15mm

Brake System

Maintenance instruction

Note

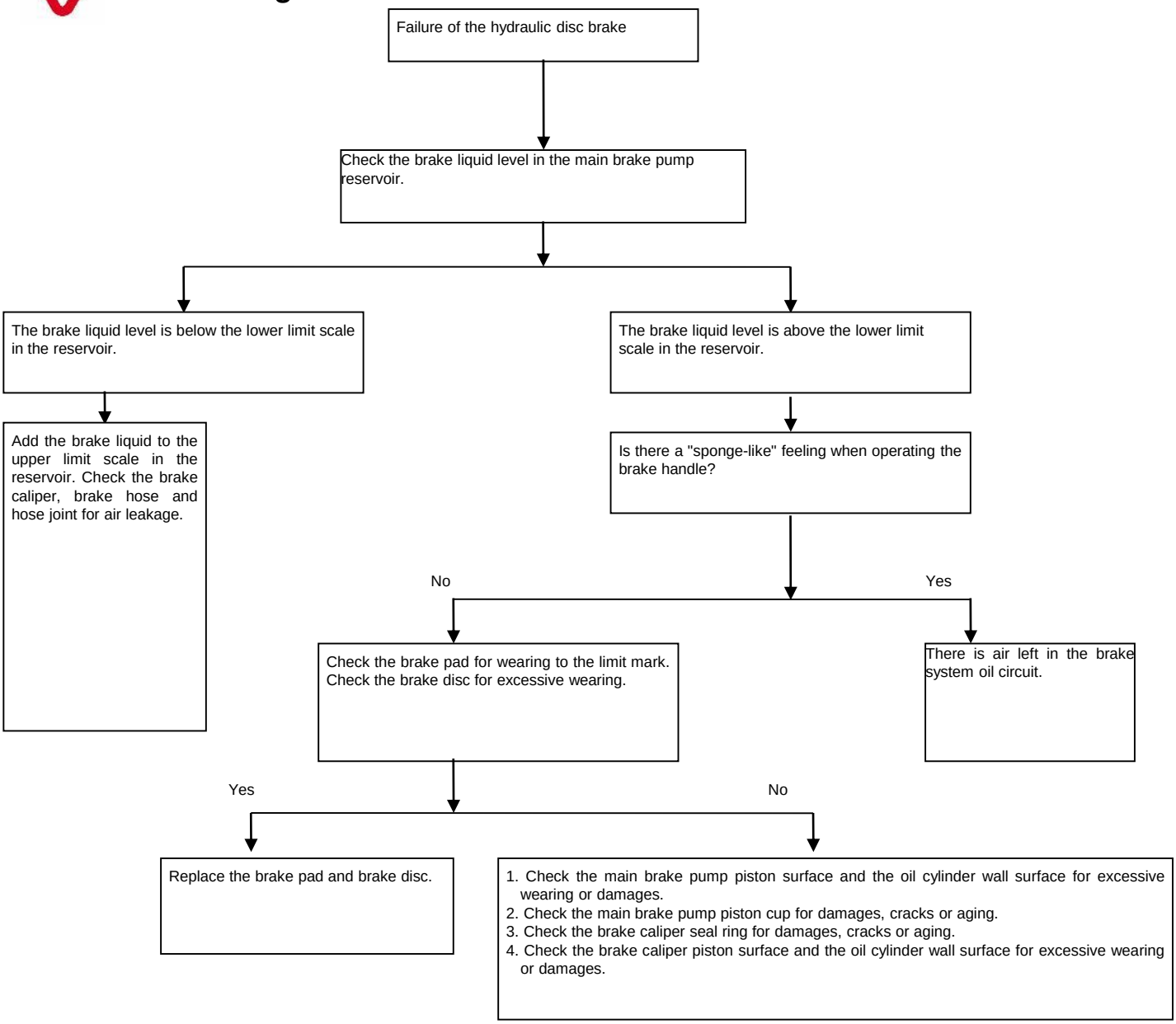
- There should be no oil stains on the brake assembly in installing or removal.
- The cleaning should be made with a specified detergent to avoid reduction of the brake performance.
- Oil stains on the brake pad will result in reduction of the brake performance
- Check the break before riding

Specifications

Item	Standard value (mm)	Minimum Thickness(mm)
Diameter of the front brake disc	φ180mm	-
Thickness of the front brake disc	4.0	3.0
Thickness of the front brake pad	4.0	3.0
brake fluid	DOT3 or DOT4	
Diameter of the rear brake disc	φ110mm	-
Thickness of the rear brake disc	3.5	2.5
Thickness of the rear brake pad	4.5	3.0
brake fluid	DOT3 or DOT4	

Torque value		
Installation screws on the front/rear hydraulic brake disc	8	Nm
Tightening bolts on the Front Brake upper pump fixing screw	8	Nm

Failure diagnosis



Failure diagnosis

The brake performance is not good.
The brake is not adjusted properly.
The brake pad and brake disc are worn.
The brake assembly is not installed properly.
The brake pad and brake disc are contaminated.
The brake responds slowly or the handle is tight.
The brake is not adjusted properly.
The brake pad and brake disc are worn.
The brake assembly is not installed properly.
There is an abnormal noise from the brake.
The brake pad and brake disc are worn.
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 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.

Disassembling

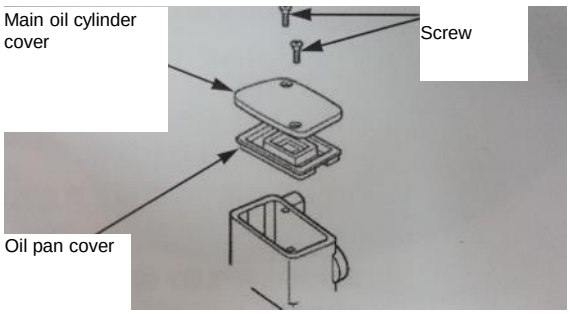
Replace the brake pad assembly.
If the brake pad assembly will be used again, then it should be marked at side before removal so that it can be installed at its original position.
Remove the following assemblies from the handle and shock absorber.
Front/Rear brake:
1. Oil pump body assembly
2. Front/Rear brake disc
3. Brake cylinder assembly
4. Brake pad assembly
5. Brake hose assembly
6. Hydraulic brake handle

There should be no oil stains on the Front/Rear 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.

Brake System

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 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.
Connect 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.

Brake liquid injection/air discharging

The following operation steps can be performed if air discharge pumps are not available.
Hold 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:

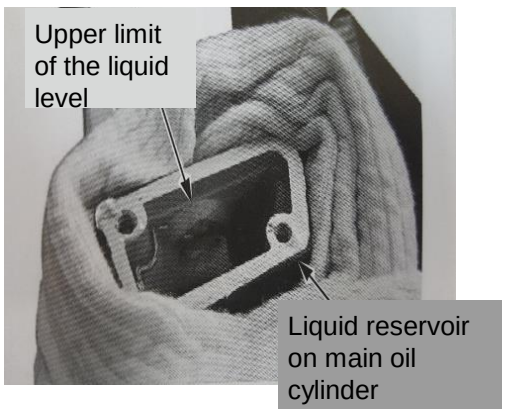
Check the brake liquid level frequently in air discharging to avoid air entrance into the hydraulic system. The brake handle should not be released before closure of the oil drainage screw.

Step1: 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.

Step2: Loosen the front brake lever slowly until the front brake lever reaches to end of its travel. Wait for several seconds.

Step3: 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

Overview

The charger will be generate heat during 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 cause personal injuries.

There is high-voltage current in the charger during charging. The charger is strictly prohibited from being 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 process is strictly prohibited from being made in a rainy, exposure or high-temperature environment or close to fire sources.
Only original charger and a stable 110-240V AC power supply should be used in charging.
The polarity of the charger output connector must be consistent with the battery output connector, otherwise the charger and battery will be damaged.

Note

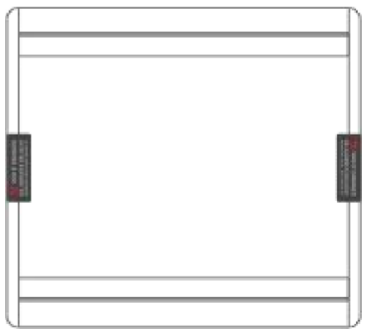
The Power Lock and Main Switch should be turned off before removal of electronic components.
The battery used for this model is a lithium battery.
Remove the battery from scooter storage for than a week, Charge the battery to approximately 50% of its capacity and store it at a room temperature.
Perform periodical charging of the battery every month. The long-term storage of battery in below 20% 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 original 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.
Battery charging is strictly prohibited 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.

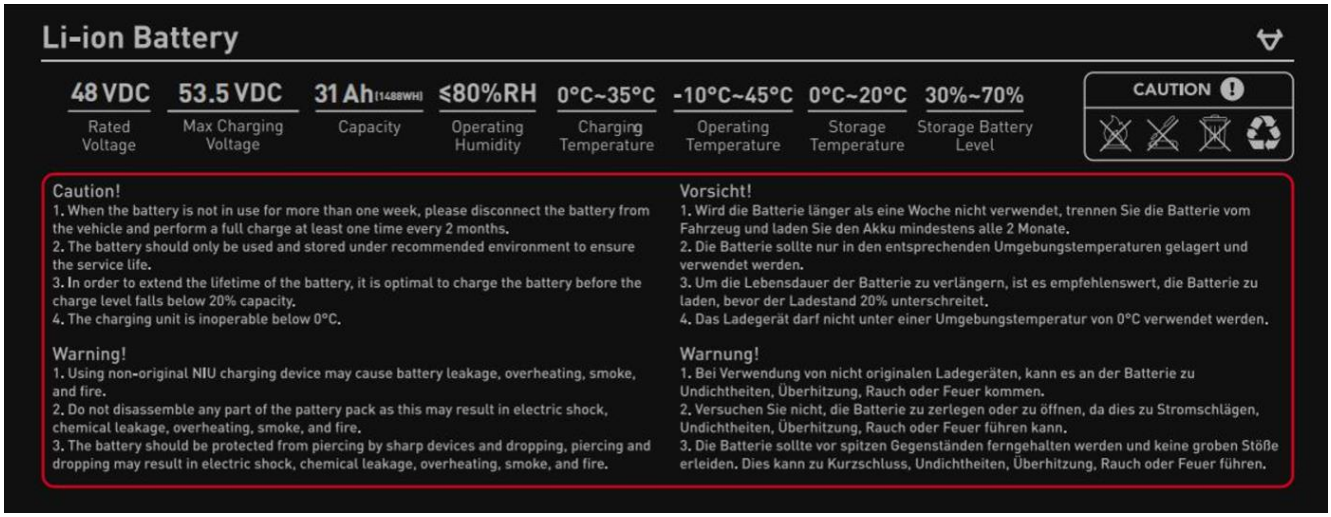
Specification

Item		Specifications
Battery	Type	lithium battery pack
	Rated voltage	48V
	Rated capacity	26/32Ah
Charger	Rated output voltage	54V
	Rated output current	3~4A

Battery Pack

48V 42Ah



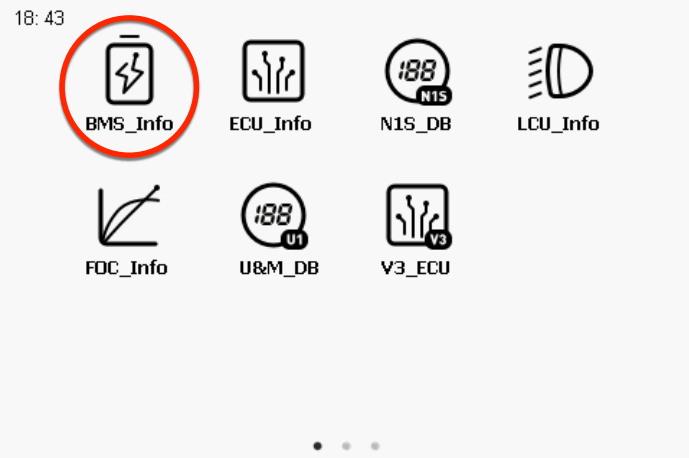


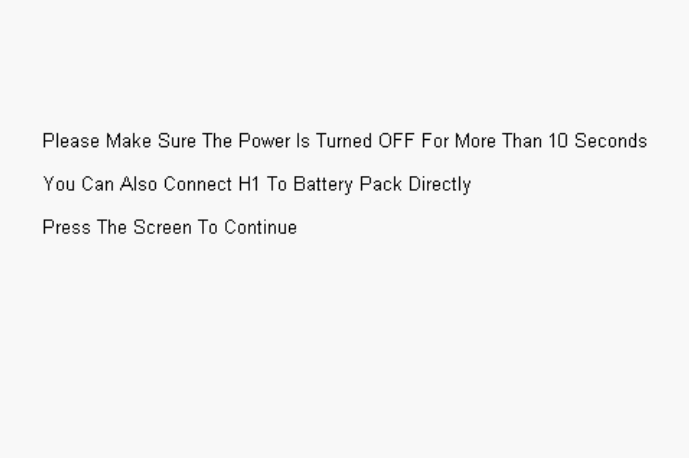
BMS introduce

V1.1.0

BMS (Battery Management System) Description

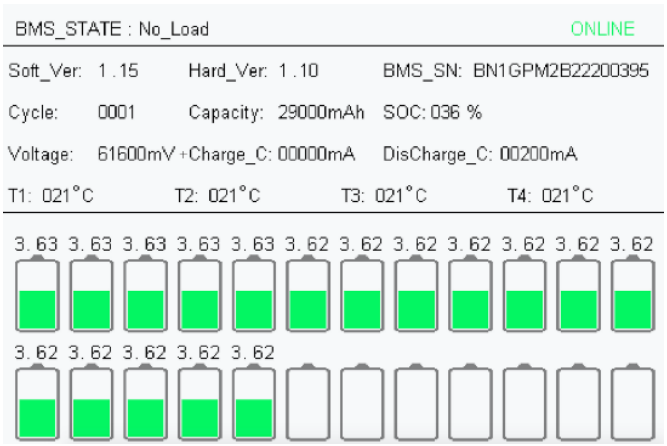
Connect H1 to Battery Pack directly, Press BMS_Info Icon to Read BMS Information

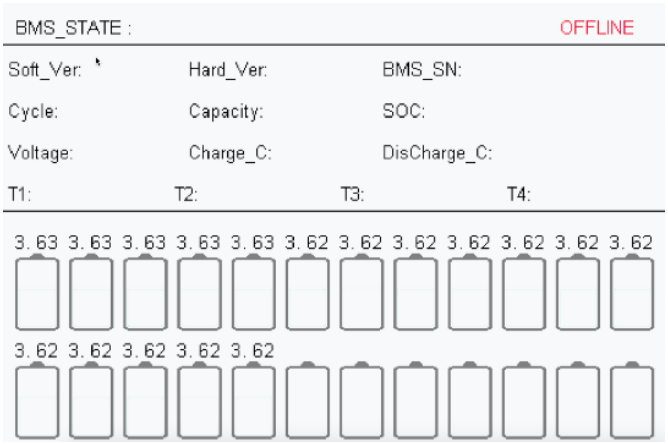




Then press the screen to continue

If BMS is working normal/abnormal, H1 will read Battery Pack info shown as below.
Replace the BMS if OFFLINE is shown.





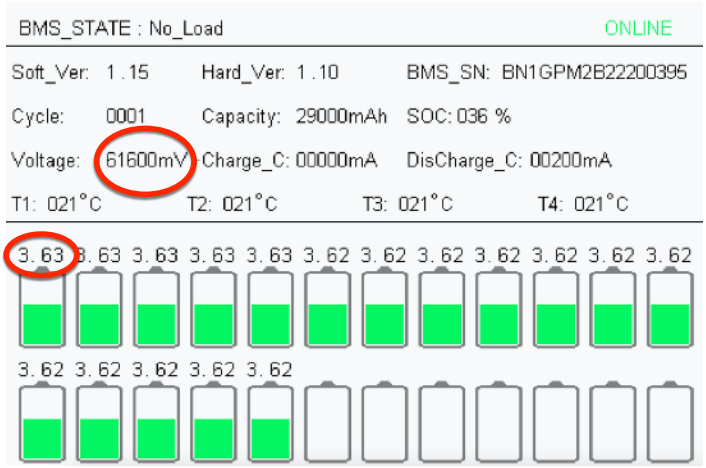
BMS_STATE: No Load
ONLINE
Soft_Ver: 1.15
Har_Ver: 1.10
BMS_SN: BN1GPM2B22200395
Cycle: 0001
Capacity: 29000mAh
SOC: 036%
Voltage: 61600mV
Charge_C: 00000mA
DisCharge_C: 00200mA
T1: 021°C
T2: 021°C
T3: 021°C
T4: 021°C
Individual Battery Cell Voltages

BMS Status: currently not in use
BMS Functioning, OFFLINE means BMS Failure, Replace BMS if necessary
Software Version: 1.15
Hardware Version: 1.10
Battery Serial Number: BN1GPM2B22200395
Number of Cycles Charged: 0001 Cycles
Battery Total Capacity: 29Ah
Remaining Battery Level: 36%
Battery Total Voltage: 61.6V
Charging Current: 0mAh
Discharging Current: 200mAh
Temperature Sensor 1: 21°C
Temperature Sensor 2: 21°C
Temperature Sensor 3: 21°C
Temperature Sensor 4: 21°C
Individual Battery Cell Voltages: 3.62V/3.63V

Table of BMS STATE(BMS Status)

No Load:
Discharging:
Charging:
Over-Charged:
Over-Discharged:
Charging Over-Current
Discharging Over-Current
Over Temperature
Temperature Low
Other Warning(Open Circuit detected/ Difference between Cell Voltages is higher than 0.3V)
Short Circuit
Water Detected
BMS MOS Failure

How to read Battery voltage （Ref 30)



Connect H1 to Battery Pack directly, Press BMS_Info Icon to Read battery total voltage and single cell voltage
The max total voltage is 71.4V and max single cell voltage is 4.2V
The max voltage difference is 0.3V
The display will show code 30 （Battery overcharge）when the battery total voltage reached 71.4V or single cell reached 4.2V

Discharging warning code 131 will show on the display when the battery total voltage below 54.4V
BMS will enter protection state when the battery total voltage below 52.7V and single cell will be 3.1V （+- 0.1V）

Charger

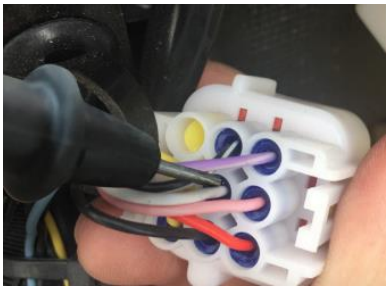
When the charger is connected with battery. The indicator of charger illuminates as Red means charging. It will turn to Green when the battery is fully charged.

Charger Specification: 5.2A 100V-240V VDE

The charger should be disconnected first from the power supply and then disconnect from the battery.

How to check Main Harness side communication wire for closed circuit (Ref: 005)

Check communication between ECU and Battery



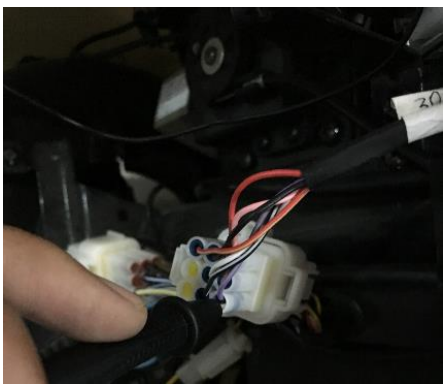
Step 1: Disconnect the main Battery
Step 2: Disconnect the ECU connector
Step 3: Connect negative pin of multimeter to pin 5 (White) of ECU female connector
Step 4: Connect positive pin of multimeter to the pin of power cord shown above(white and grey)
Step 5: Set multimeter to test closed circuit mode which should beep if the circuit is closed.

Alternative Method: Please refer to <How to Read Vehicle Communication Data> of H1 User Guide.

Check communication between ECU and FOC controller

Step 1: Disconnect the main Battery
Step 2: Disconnect the ECU connector
Step 3: Connect negative pin of multimeter to pin 3 (grey and violet) of ECU female connector
Step 4: Connect positive pin of multimeter to the pin 23 of FOC controller connector(grey and violet)
Step 5: Set multimeter to test closed circuit mode which should beep if the circuit is closed.

Alternative Method: Please refer to <How to Read Vehicle Communication Data> of H1 User Guide.

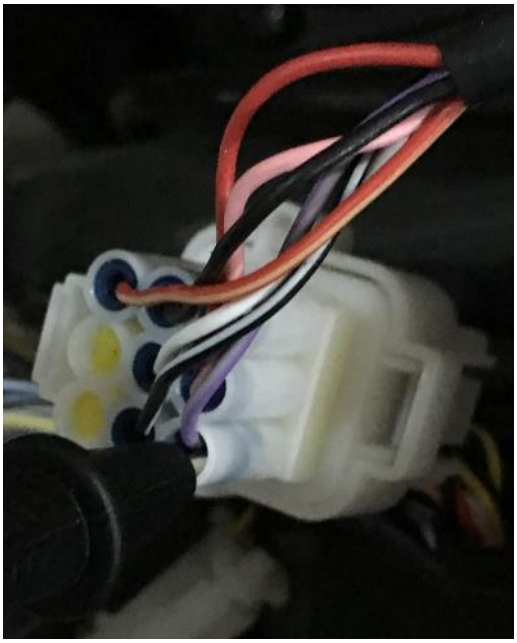


Caution: Please be very careful when checking the FOC controller connector, insert only Thin pin to for check up. Do Not damage the connector which may cause bad connection.

Check communication between ECU and Display

Step 1: Disconnect the main Battery
Step 2: Disconnect the ECU connector
Step 3: Connect negative pin of multimeter to pin 3(grey and violet) of ECU female connector
Step 4: Connect positive pin of multimeter to the pin 7(white) and pin 9（purple and grey）of Display connector
Step 5: Set multimeter to test closed circuit mode which should beep if the circuit is closed

Alternative Method: Please refer to <How to Read Vehicle Communication Data> of H1 User Guide.



Electrical System

Motor

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 riding. 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 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 Specification

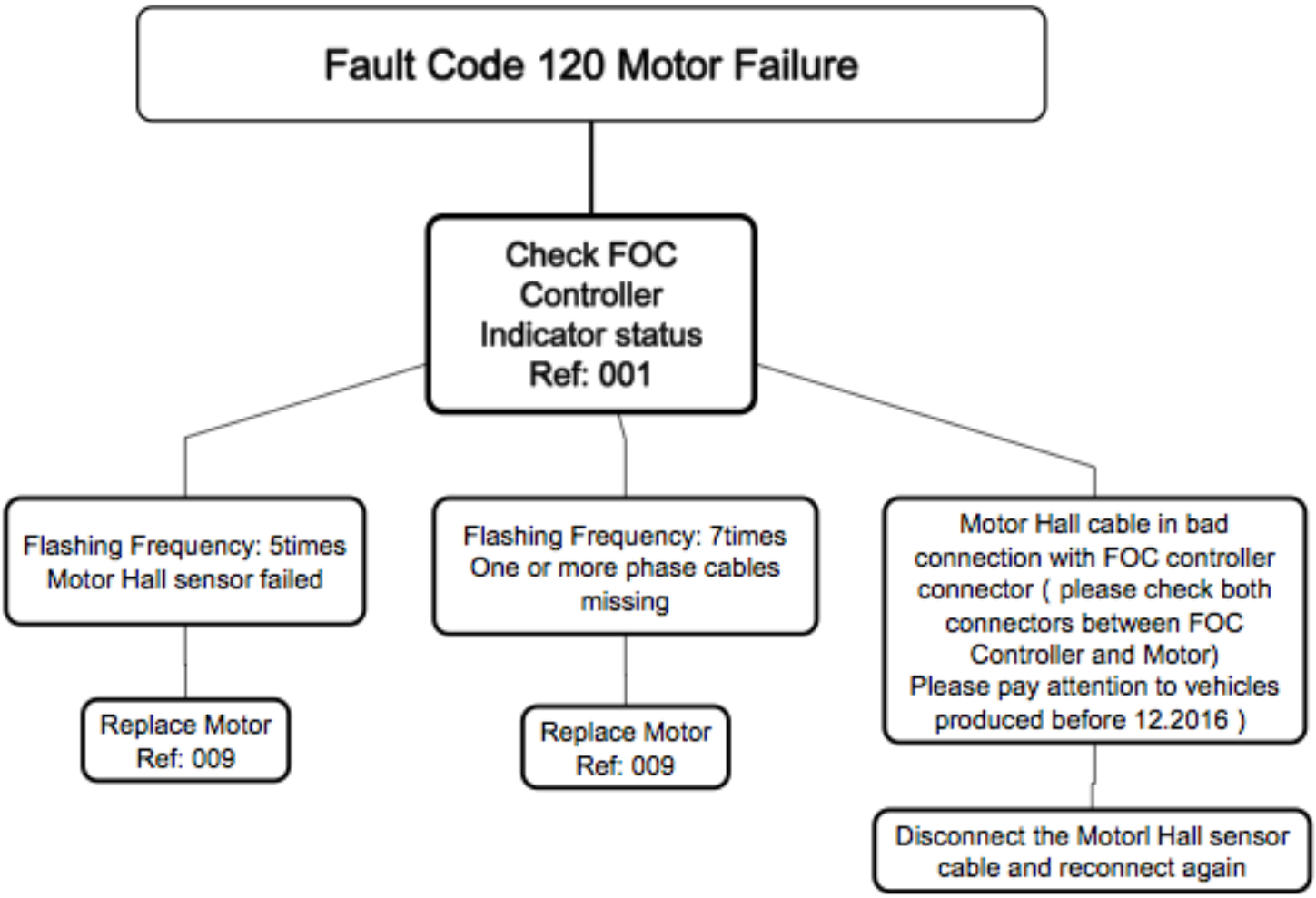
Item		Specifications
Motor	Motor type	Brushless permanent-magnet motor
	Control method	FOC vector control
	Rated voltage	DC48V
	Rated power	800W/1200W
	Maximum motor power	1584W/1920W
	Maximum motor torque	95Nm/110Nm
Controller	Rated voltage	DC48V
	Maximum current of the controller	33A/40A

Motor

The brushless DC motor is customized by BOSCH. There is a hall sensor from motor to connect on the main harness side. And three phase cables connect with FOC controller.

Sport version: use 48V 1200W
Lite version: use 48V 800W

Error code troubleshooting as below:



FOC Controller

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.

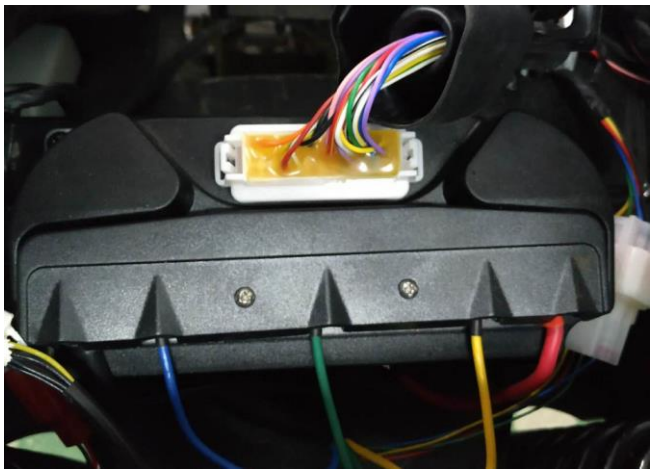
4. Power cut-off protection in charging or braking

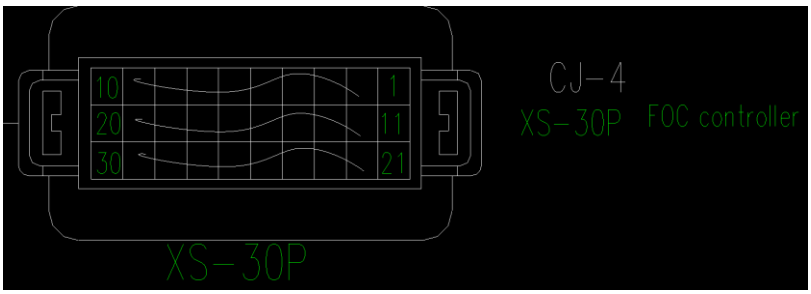
The controller stops the motor automatically to avoid unexpected injuries when the vehicle is being braked or charged.

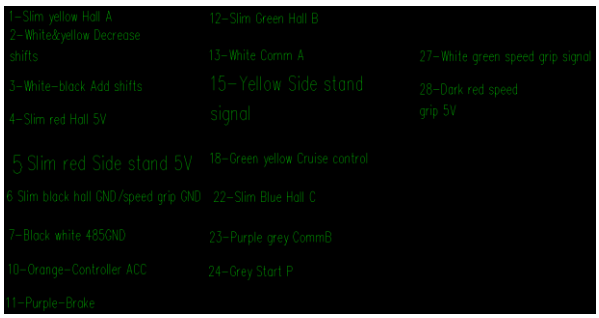
5. Control loss protection

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.

FOC controller







FOC controller connects with battery via red and black wires directly and motor via three pieces of phase cables from motor.

About the 30pins connector:
To view the connector cabling layout forward the rear part side as the picture shows.

Different pins send different orders to controller that allow it communicate with ECU,battery,motor,side stand,central stand, P button, Right grip twist.

About the firmware:
The firmware of FOC controller could be reprogrammed by H1 after any fault or such part replaced.
M+ sport and M+ lite use different speed version firmware.

How to read FOC controller indicator flashing frequency (Ref: 001)

- Turn ON the power and count how many times the indicator flashes between each interval.
- If FOC controller is in good working condition, after turning ON the power, the indicator should only flash once and no more flashing

FOC Controller Flashing Indicator Explanation			
Flashing Frequency	System protection feature		Solution
1	Over-Voltage warning	Battery voltage is higher than default value	
2	Under-Voltage warning	Battery voltage is lower than default value	
3	Over-Current warning	Instant current is higher than default value or Phase line short circuit	
4	Locked-rotor warning	Duration of Motor in locked-rotor status longer than default value	Replace FOC controller
5	HALL failure	Incorrect HALL input(Voltage) detected	Replace Motor
6	MOSFET failure	MOSFET power self-check failed	Replace FOC controller
7	Phase default warning	one or more of motor phase lines missing	Replace Motor
9	Brake applied	Controller in the braking status	
10	Self-checking failure	System on the internal electrical self-checking found abnormal	
11	Controller over-heat warning	Temperature is higher than default value	Stop riding until FOC controller cool down
14	Cable Hall Sensor Failure	Twist grip/Cable Hall Sensor Malfunction	
15	Alarm in active state	Alarm activated	
17	Communication failure	Communication between ECU and FOC controller failed	Replace FOC controller

How to check FOC Controller power INPUT (Ref: 013)

Step 1: Turn the power OFF.
Step 2: Check voltage of the main power cord by disconnecting the following connectors:
- FOC Controller connector
- Red and Black wires

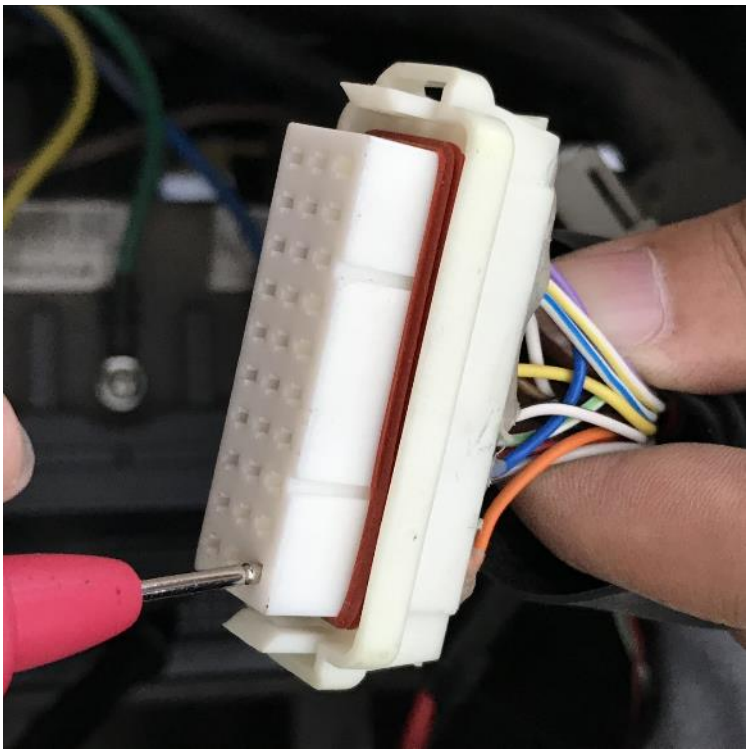
Step 3：Check DC voltage between the Red wire and Black（Negative）at harness side.
Step 4：Turn the power ON and DC voltage reading on multimeter should be same as battery voltage.

How to check FOC controller ACC wire of Alarm for closed circuit (Ref: 007)

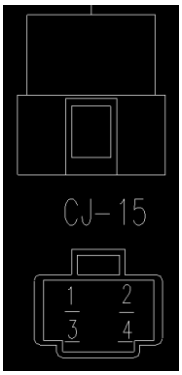
Step 1: Turn the power ON.
Step 2: Check voltage of the PIN 10 orange（ACC power lock）by disconnecting the following connectors:

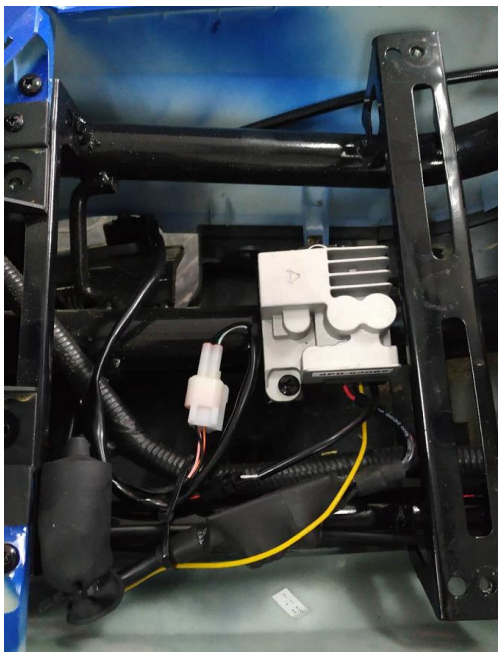
- FOC Controller connector
- Red and Black wires

Step 3：Check DC voltage between the PIN 10 orange（ACC power lock） and Black（Negative）at harness side.
Step 4：Turn the power ON and DC voltage reading on multimeter should be same as battery voltage.



DC-DC





DC-DC

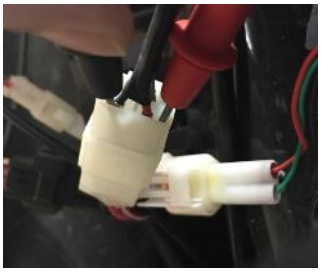
DJ7041-6.3-11(White)

1	Red& Green	DC+
2	Black	Negative
3	Black	Negative
4	Red& White	12V

DC-DC: The battery 48V connects it directly and DC converts 48V to 12V voltage to dashboard and all the lights.

How to check DC-DC Converter power input (Ref: 015)

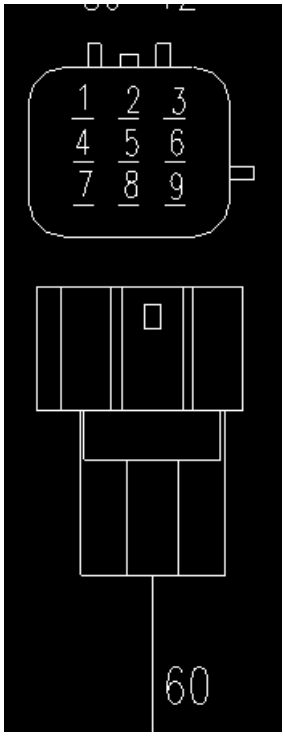
Step 1: Turn the power ON.
Step 2: Check DC voltage between the Red-Green wire and Black（Negative）at component side.
Step 3: DC voltage reading on multimeter should be same as battery voltage.



How to check DC-DC Converter power output (Ref: 016)

Step 1: Turn the power ON.
Step 2: Check DC voltage between the Red-White and Black（Negative）at component side.
Step 3: DC voltage reading on multimeter should be ~12V

Alarm



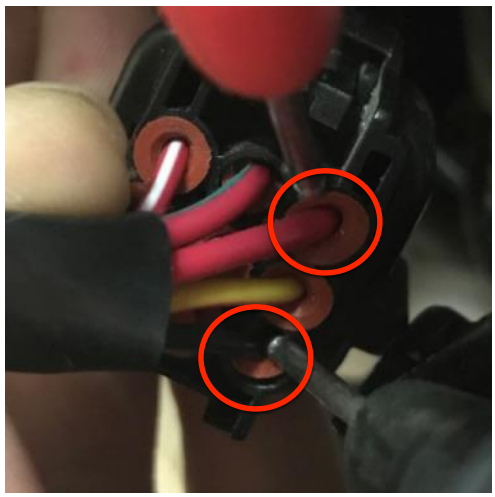
1	Red& White	12V	6	Yellow1	Theft signal
2	R&Green	DC+	7	Light blue	Turn Right
3	Red	60V	8	Orange	ACC
4	Yellow	Turn Left	9	Black	Negative
5	Pink	Power lock			

Alarm
DJ7091Y-2.3-11(Black)

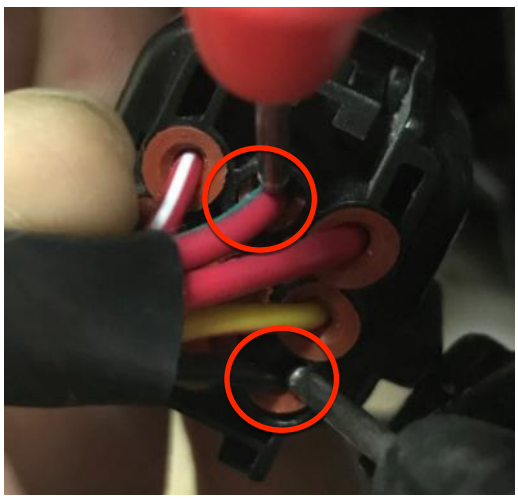
Alarm: It connects with the battery directly. And it also transmits 48V to DC-DC module.
9 pins connector.
It could control the power supply after get command LOCK/UNLOCK.

How to check Alarm (Ref: 017)

Step 1: Press buttons of the remote, the remoter indicator should light up, if not, use the backup remoter or Check the remoter battery
Step 2: if the siren doesn't work after pressing the remote buttons, then replace the alarm
Step 3: if both siren and lights work after pressing remote buttons, then check alarm voltage input/ output
Step 4：Use a multimeter and set to DC，measure alarm voltage input(Negative to Black wire, Positive to Red wire), should get result equal to battery voltage.



Step 5： measure voltage output to DC-DC(Negative to Black wire, Positive to Red/Green wire), should get result equal to battery voltage, if not, replace the alarm

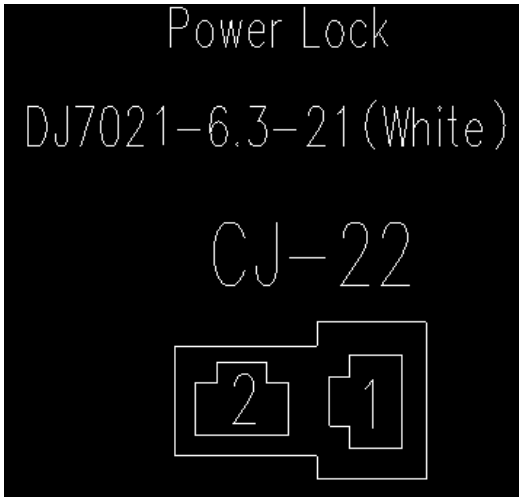


How to adjust Alarm sensitivity (Ref: 018)

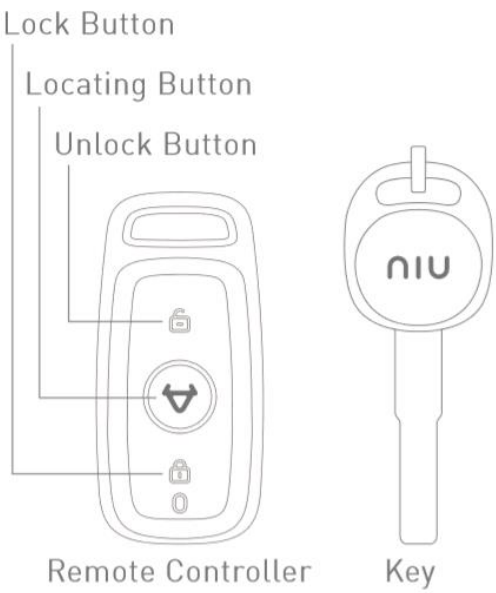
Press LOCATING button and hold until start beeping(once is least sensitive and 5times is most sensitive),
release your finger to select sensitivity setting

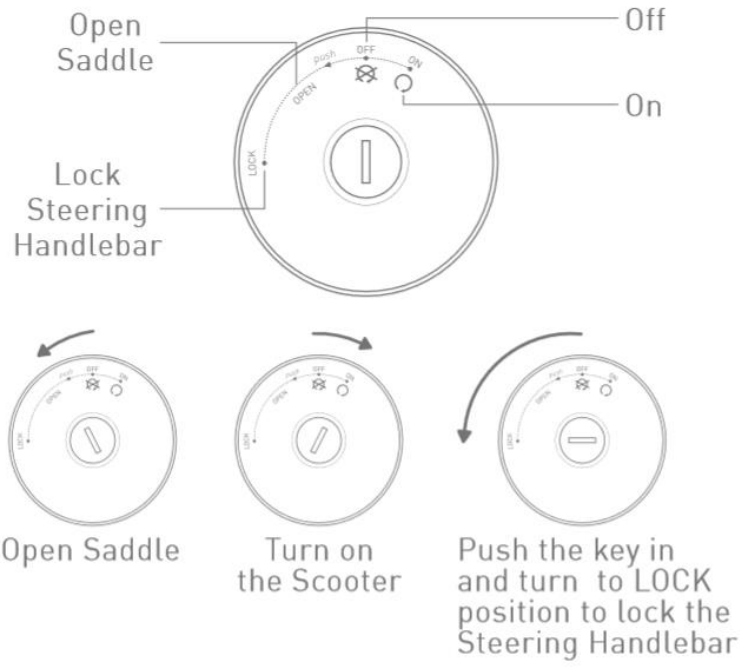
Power Lcok

1	Red	60V
2	Pink	Power lock



Operation Guide

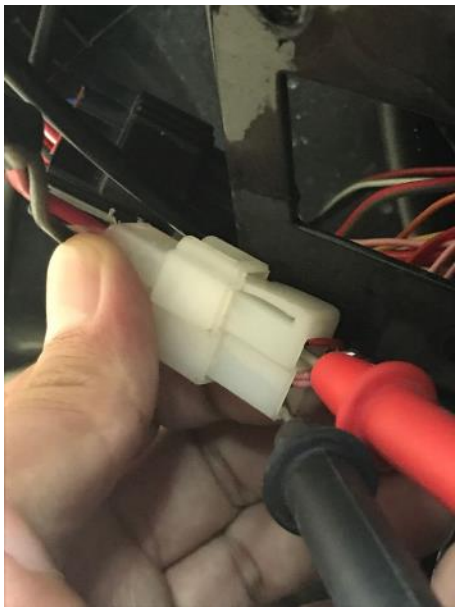




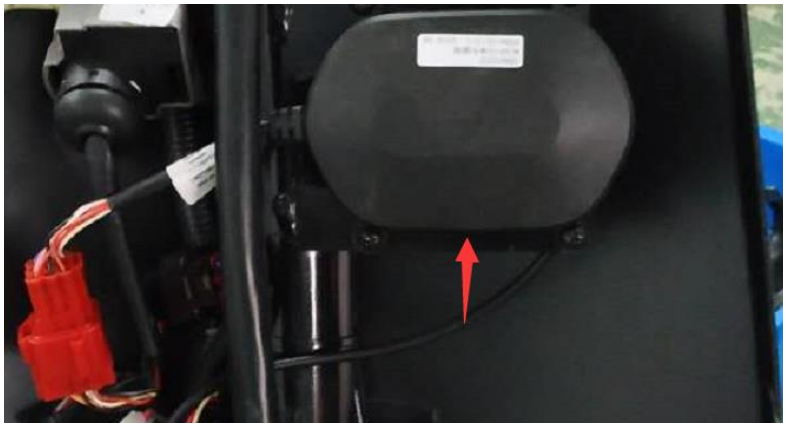
How to check Power Lock (Ref: 020)

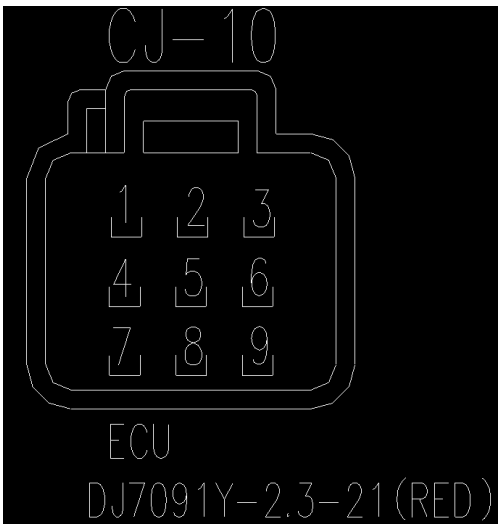
Step 1: Check DC voltage between Pink wire and Red wire
Step 2: DC voltage reading on multimeter should be same as battery voltage

If battery voltage does not exist, replace the power lock.



ECU-V2





1	Red	60V	4	Black	Negative
2	Pink	Power Lock	5	White	Comm A
3	P&Grey	Comm B	6	B&White	485 GND
7	Yellow1	Theft Signal	9	Yellow	& hx

w1

ECU: Electronic central unit. It is the most core and important part of scooter. It communicates with all the electronic parts on vehicle and analysis them then require the related electronic parts to realize features.Meanwhile it would send all the vehicle data including positioning data to cloud by built-in communication module.Thus the user could check his scooter in APP side.

ECU OTA
It could be updated via OTA and H1.The latest firmware version is TRA01C19.

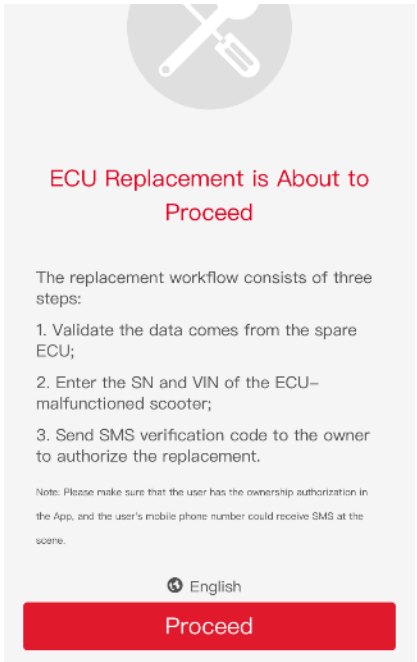
How to check ECU by checking App Data (Ref: 002)

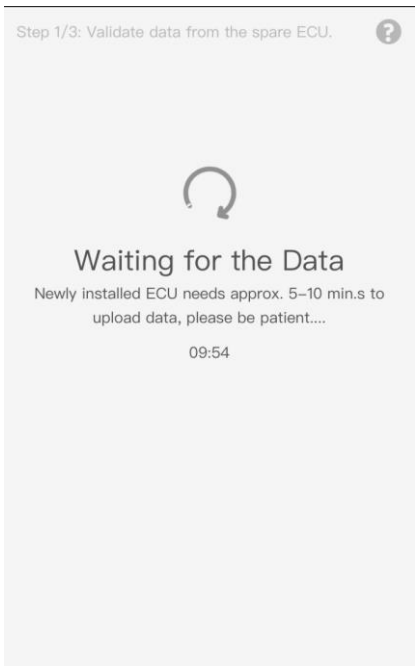
- This method only applied to scooter with activated SIM card
- Log into NIU E-scooter App to check latest data update, replace ECU if data is not up to date

How to replace ECU (Ref: 003)

Check the above dismount and mount process to replace an spare ECU.

Then scan the qr code use your phone to get the link binding on web.



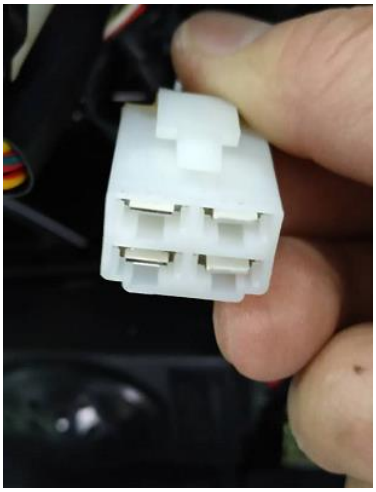


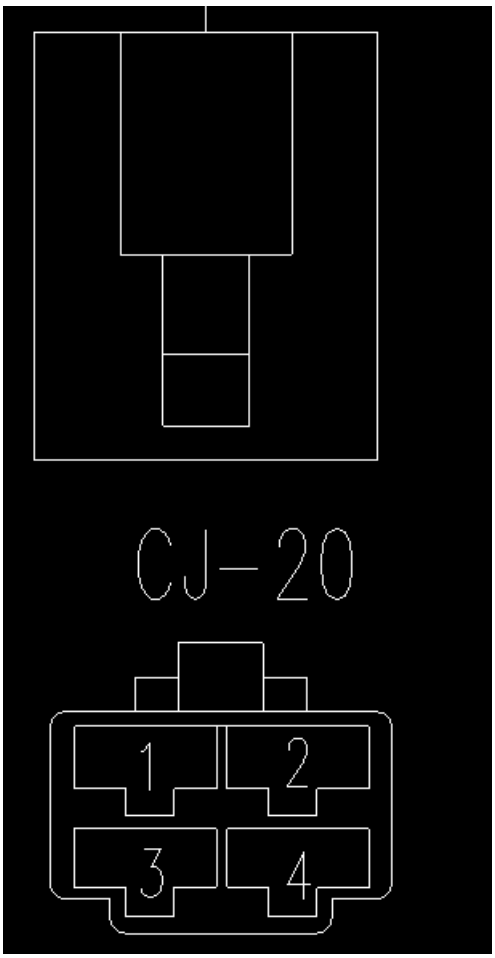
Input details of the vehicle which the spare part ECU is about to be installed,
information such as Vehicle Frame Number, Vehicle SN and mobile number which was bound on the App.

Update ECU with latest program by H1 or OTA

Check App status after 24 hours or contact questions@niu.com

M+ Head lamp





Front head lamp

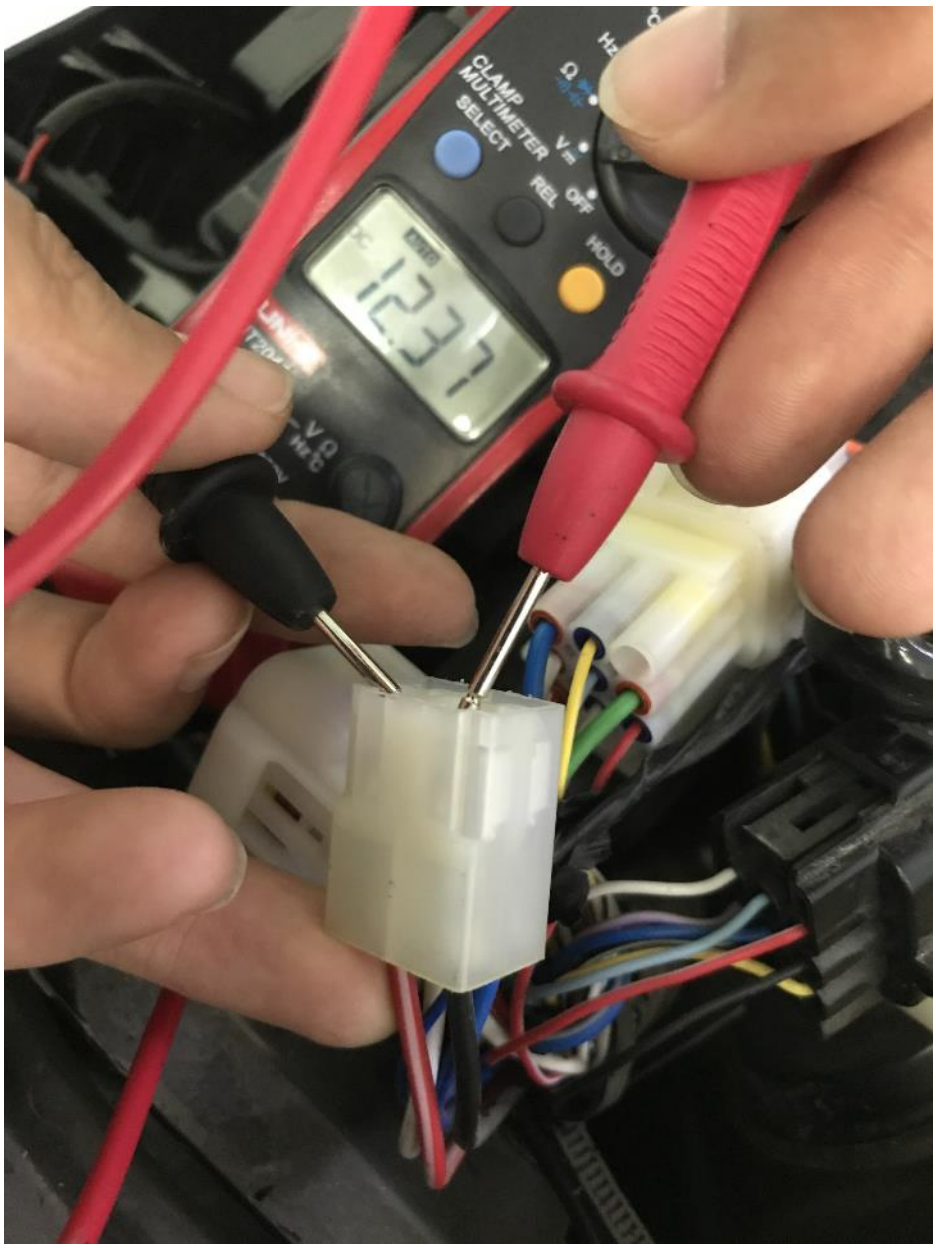
DJ7041-6.3-21

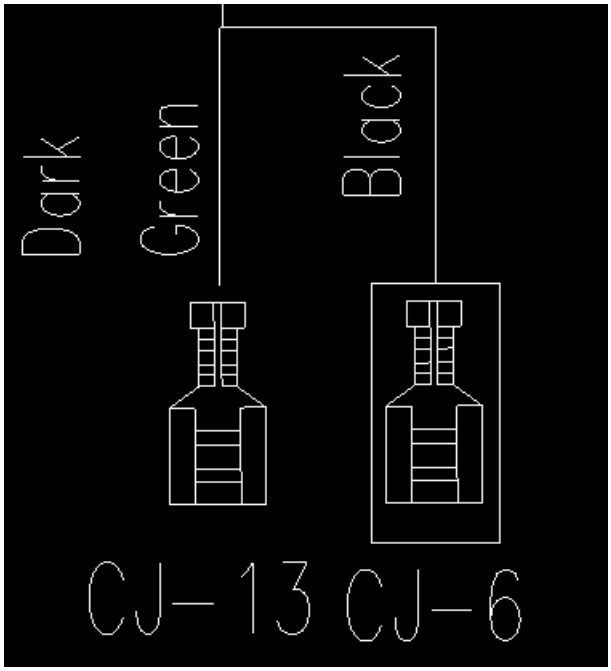
1	White1	Low Beam
2	Blue	High Beam
3	Red-W	12V
4	Black	Negative

How to check Headlight Power Input (Ref: 023)

Step 1：Turn the power ON
Step 2：Check DC voltage between Red-White wire and Black wire
Step 3：DC voltage reading on multimeter should be ~12V

If 12V exist but Headlight does not illuminate, replace Headlight
If 12V does not exist, harness is broken

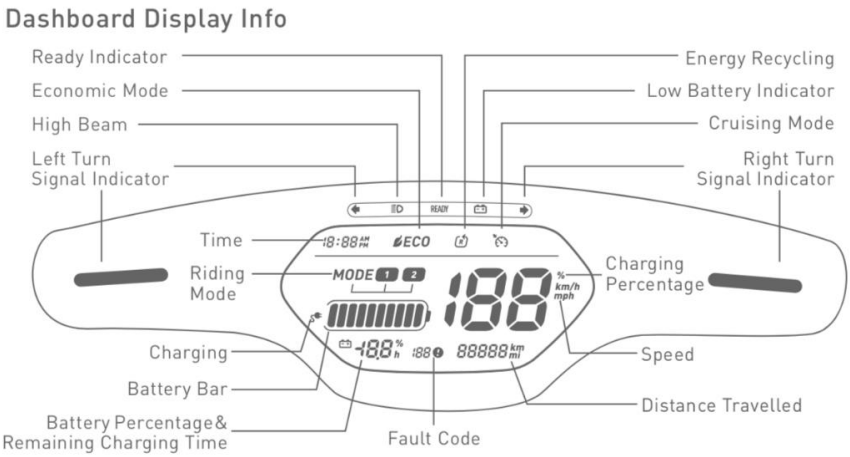



Dark Green
Black
CJ-13
CJ-6

Handlebar lock

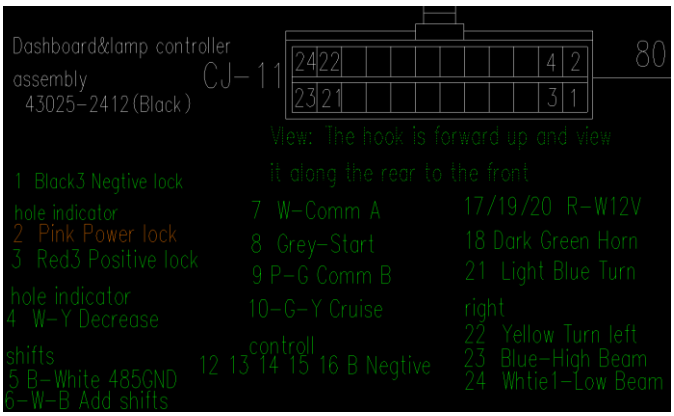
Screws: Hexagonal flower shaped head anti-theft screw,M6*20

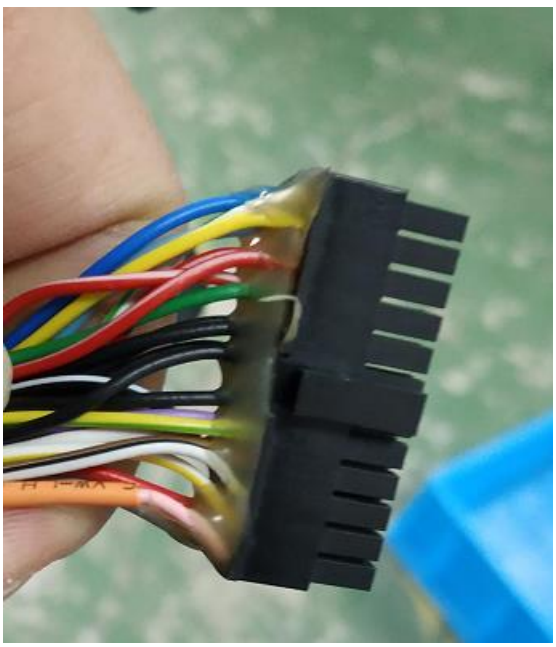
Dashboard

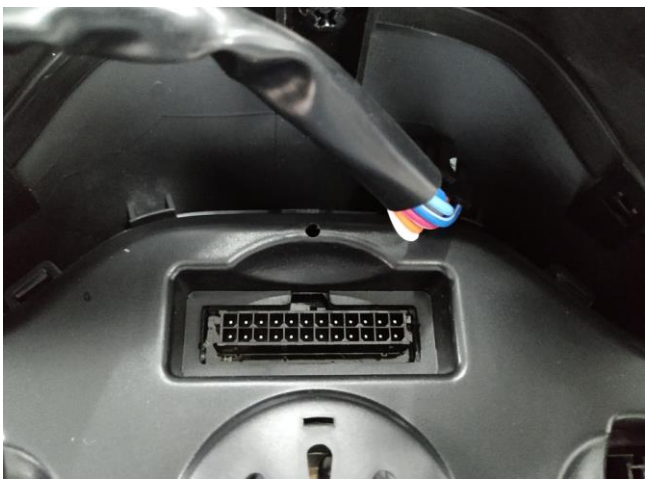


Dashboard assembly

M+ series don’t have separate lamp controller. It is integrated in the dashboard.







Dashboard Display Info

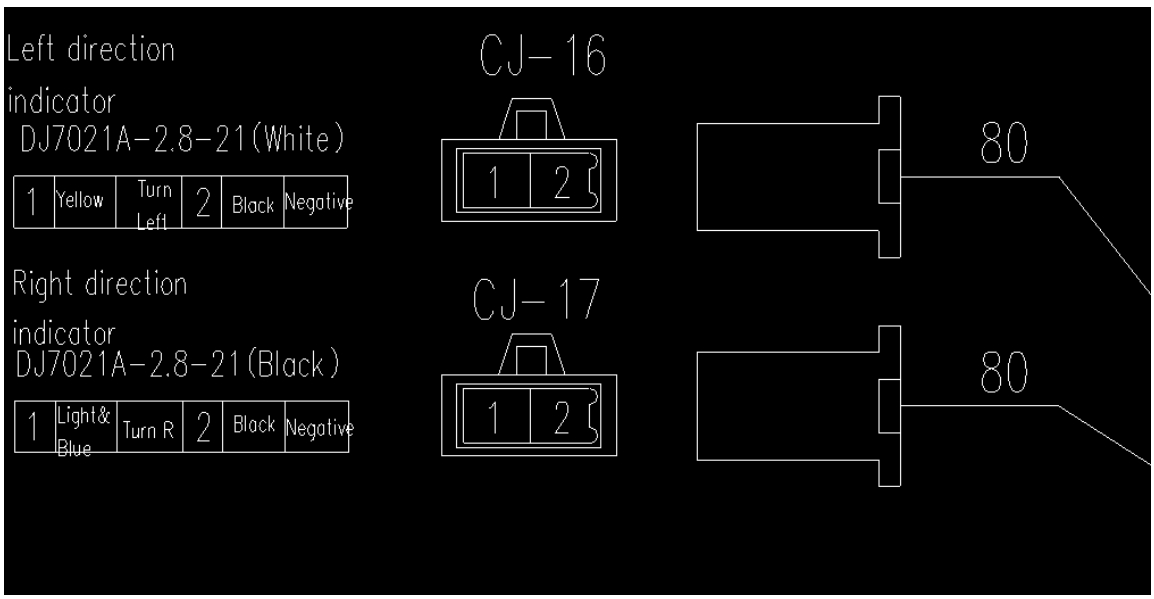
	Left Turn Signal Indicator	The Left Turn Signal Indicator is on.
	Right Turn Signal Indicator	The Right Turn Signal Indicator is on.
	High Beam	The High Beam is on.
P	Parking Indicator	In Parking Mode.
	Low Battery Indicator	Battery level less than 20%.
12:00 PM	Time	Now is 12:00 pm.
ECO	Economic Mode	Ideal energy consumption status.
R	Energy Recycling Status	Energy is being recycled from braking.
MODE 2	Riding Mode	Mode 2 is selected.

Dashboard Display Info

26 km/h	Speed	Current speed is 26km/h.
13 %	Charging Percentage (Large)	Current battery charging progress is 13%.
	Battery Bar	Current battery level. E: Low battery (less than 10%) F: Full battery (more than 90%)
89%	Battery Percentage (Small)	Battery level in percentage is 89%.
- 3.2h	Remaining Charging Time	The remaining charging time is 3.2 hours.
	Charging	The battery is being charged.
00802 km	Distance Travelled	Distance Travelled is 802km.

Left and Right direction indicator

The left and right combination switch are integrated in the dashboard.

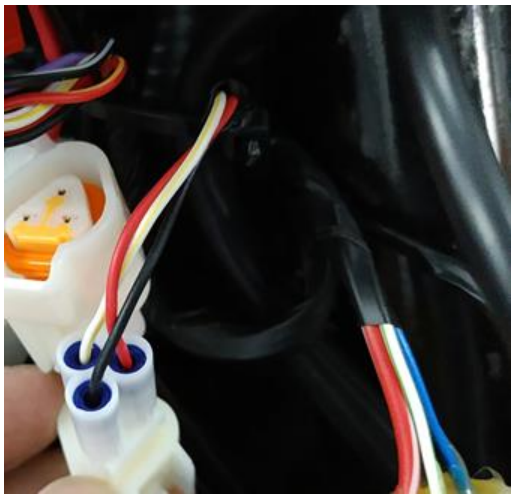


Front wheel hall sensor

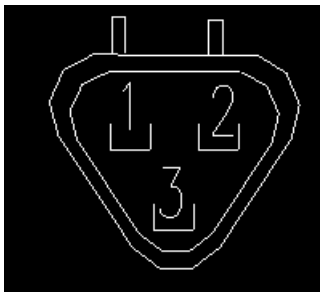
DJ7031Y-2.3-11(White)
Front wheel hall

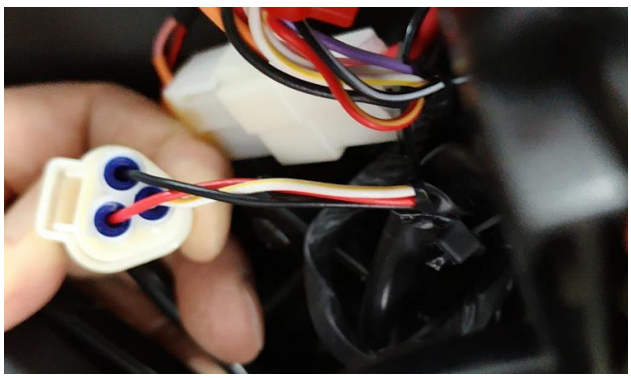
sensor

1	Black	GND	3	Y&w1	hx
2	Red2	5V			

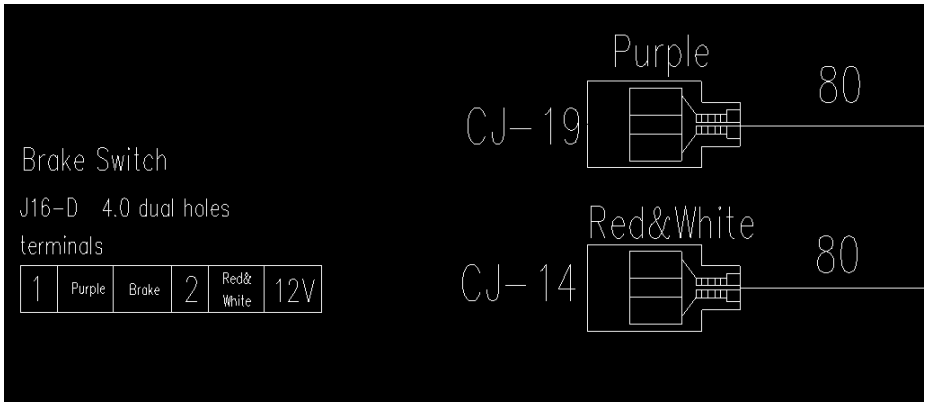


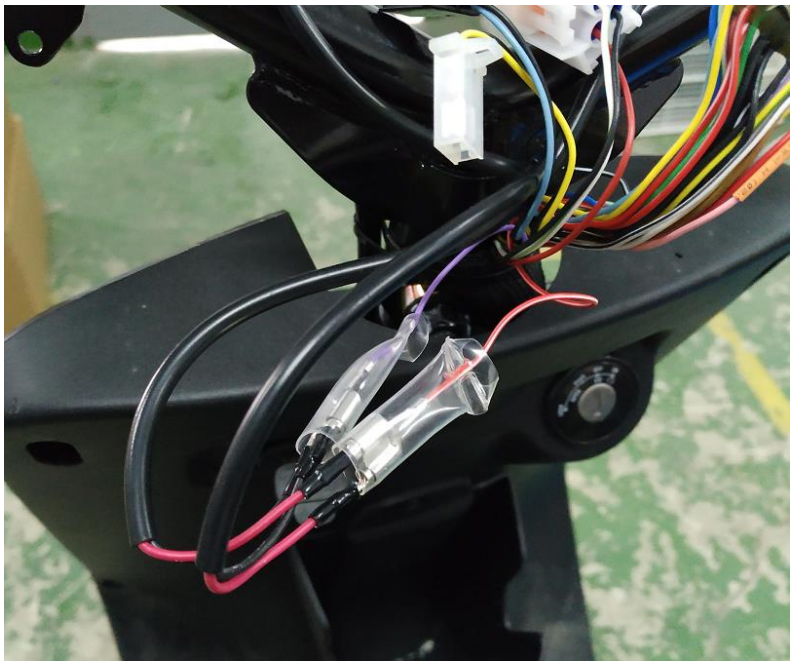
It is installed on the front wheel.
By the sensor to measure the wheel speed and send to ECU
To compare if it were overspeed.



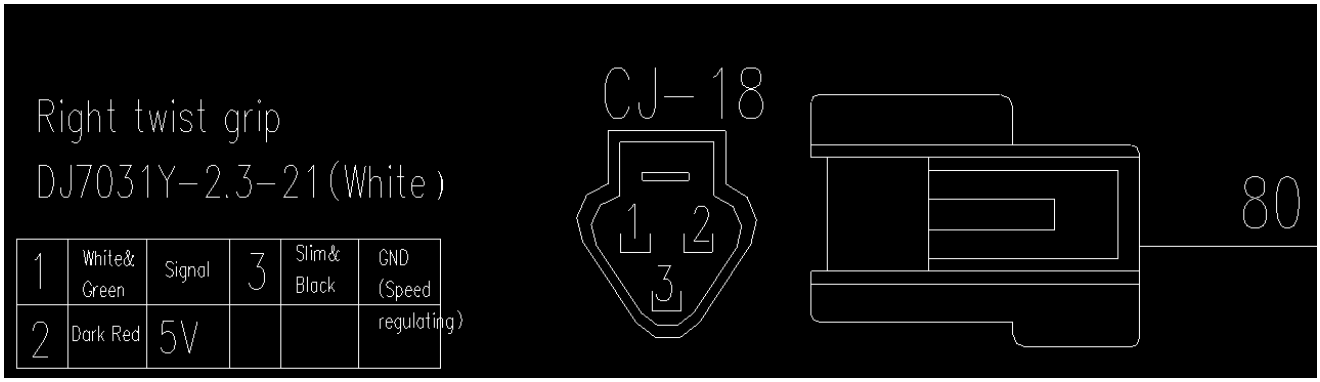


Brake Switch

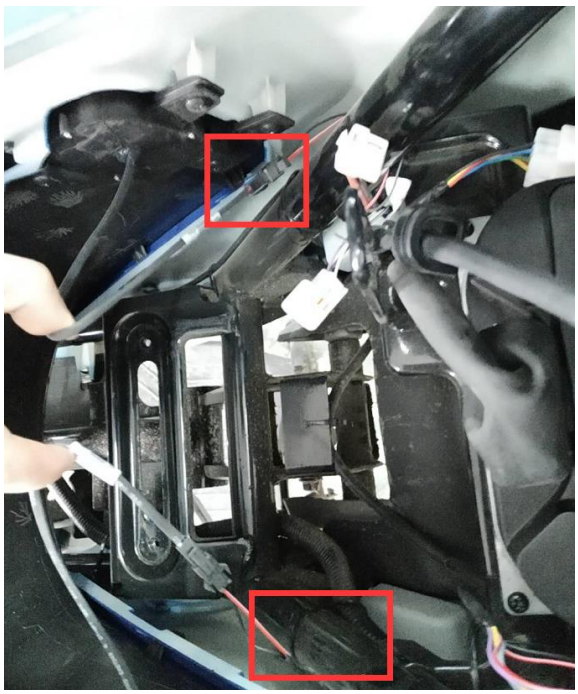




Handle grip (Right twist grip)



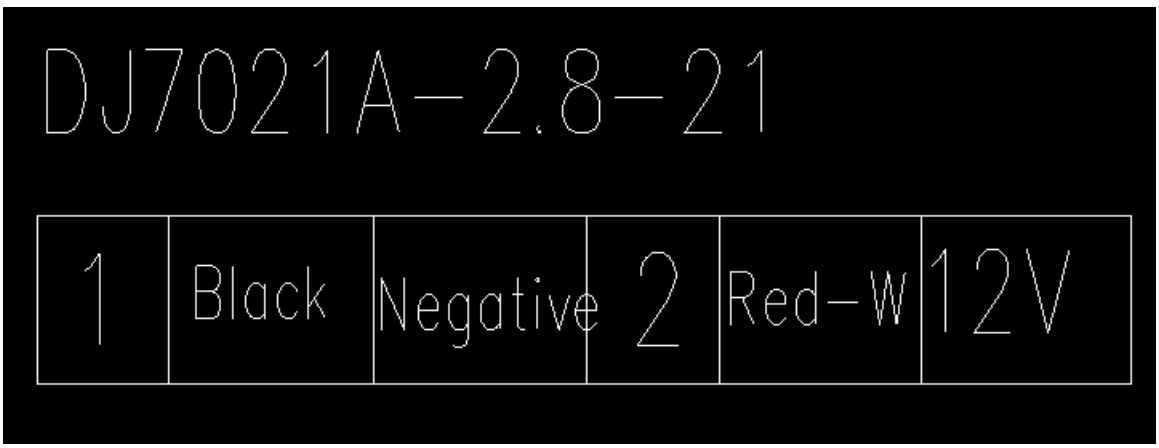
M+ left and right decorative lamp assembly



LED 8 lamp beads, power: 0.08w current: 6.5ma

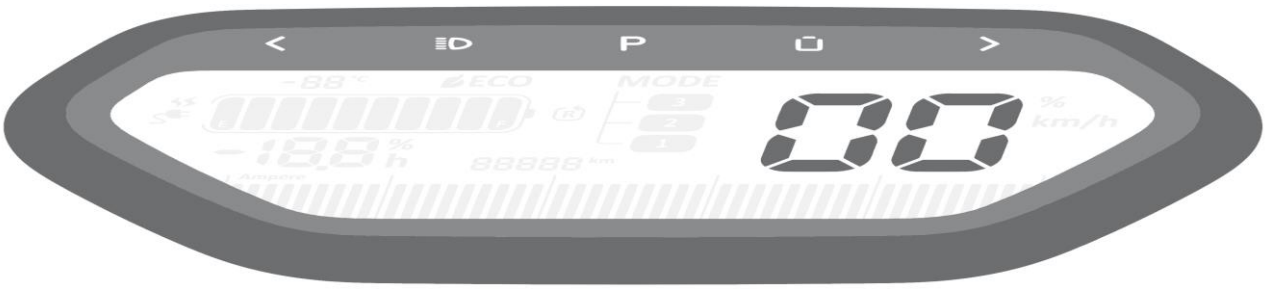
V1.1.0

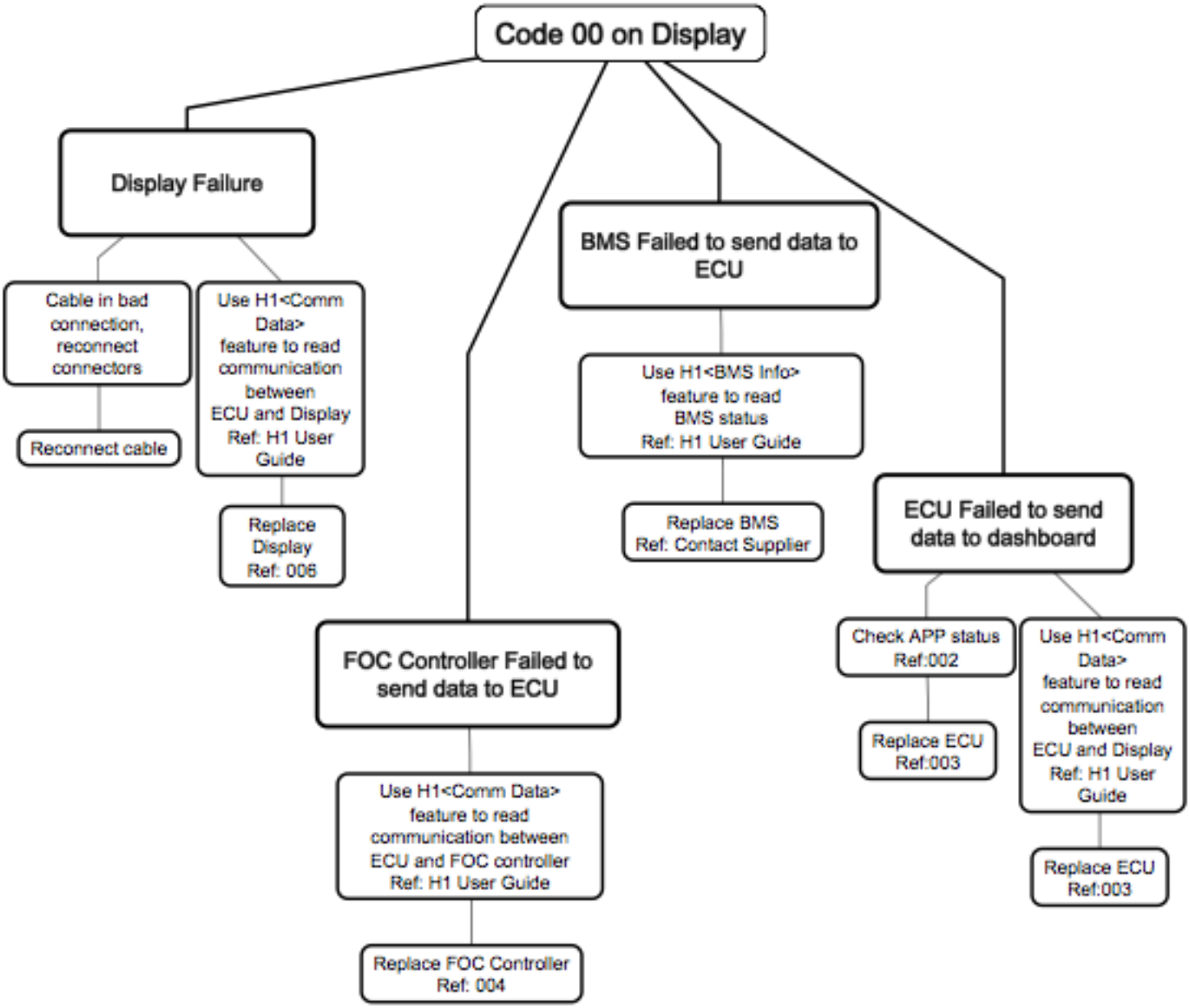
Number Plate light



V1.1.0

Diagnostic Code - 00 on display





Diagnostic Code - 10/11/12/13 on display

Fault Code 10/11/12/13

Fault Code 10: Locked Rotor

- Check FOC Controller indicator status Ref:001
  - Replace FOC Controller Ref:004
- Release Twist grip and restart the scooter again

Fault Code 12 : Battery Over-Current

- Use H1 to check Battery Total Current Ref: H1 User Guide
  - Replace battery if greater than 0.5A
- Check FOC Controller indicator status Ref: 001
  - Replace FOC Controller Ref: 004

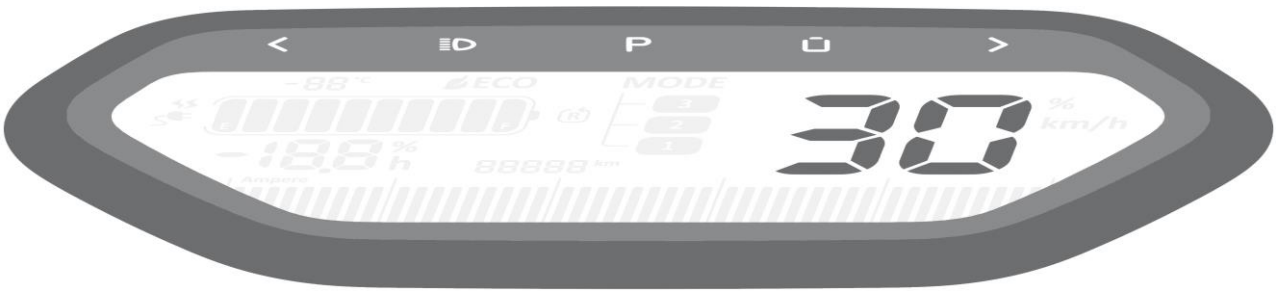
Fault Code 13: Battery/FOC Controller Over-Temperature

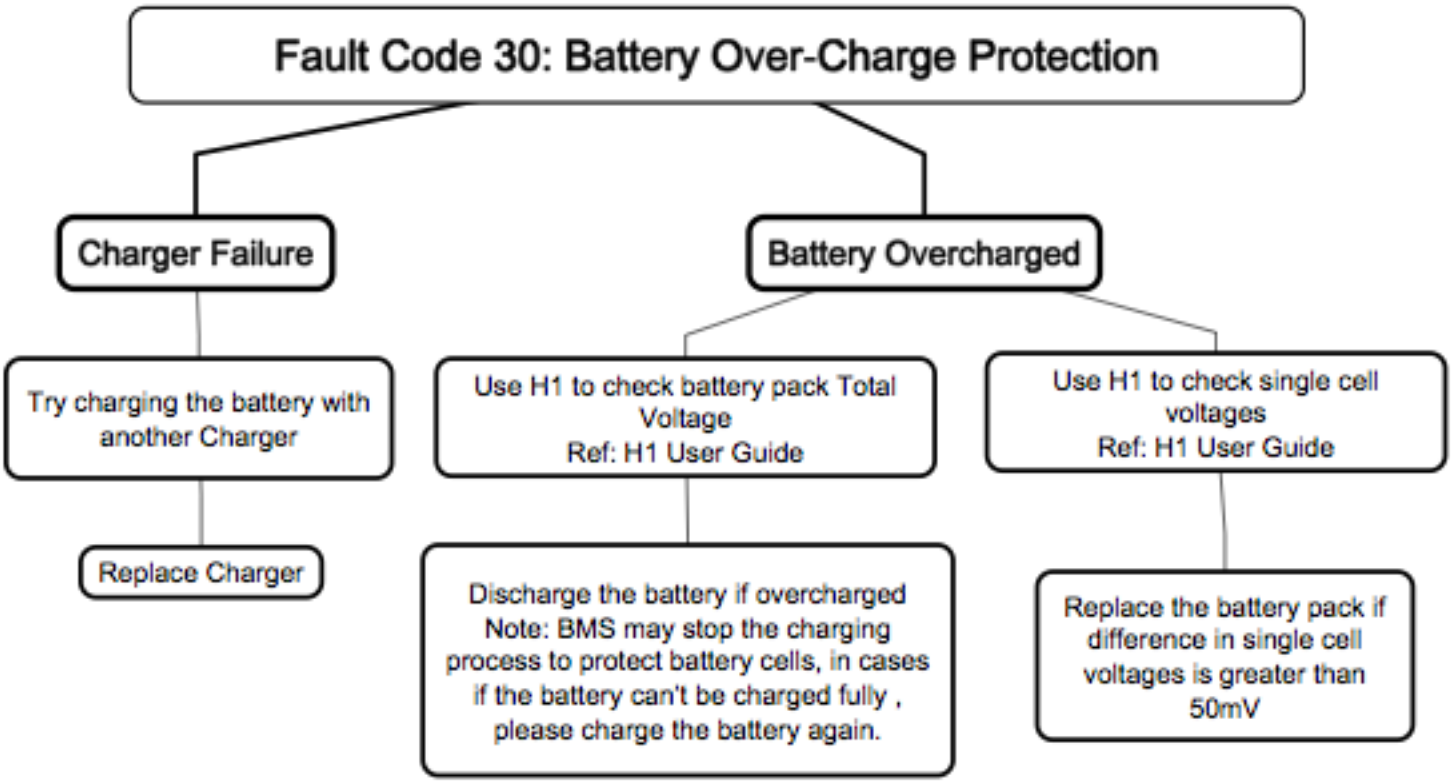
- Use H1 to check battery temperatures Ref: H1 User Guide
  - Disconnect the battery and cool down before reuse
- Check FOC Controller indicator status Ref: 001
  - Replace FOC Controller Ref: 004

Fault Code 11: FOC controller UnderVoltage/ OverVoltage

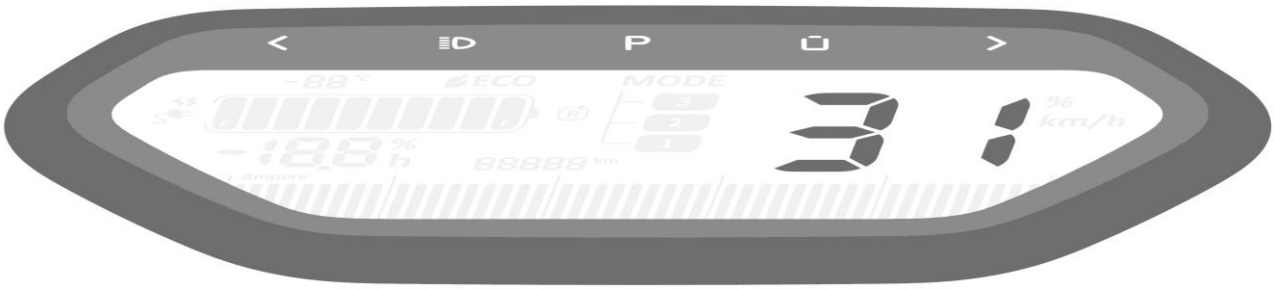
- Slow down if exceed speed limit
  - Use H1 to upgrade BMS Value to 29A Ref: H1 User Guide
    - Use H1 to upgrade FOC Controller program if available Ref: H1 User Guide
- Check battery voltages with H1 Ref: H1 User Guide
  - Charge the battery if low
    - Replace Battery if voltage difference between cells is greater than 50mV
  - Discharge the battery if voltage is high, Check and charger output voltage
    - Replace the Charger
    - Replace Battery if voltage difference between cells is greater than 50mV
- Check Connectors of BMS Controller are properly attached Ref: Contact Supplier
- Check Connectors of FOC Controller are properly attached Ref:004

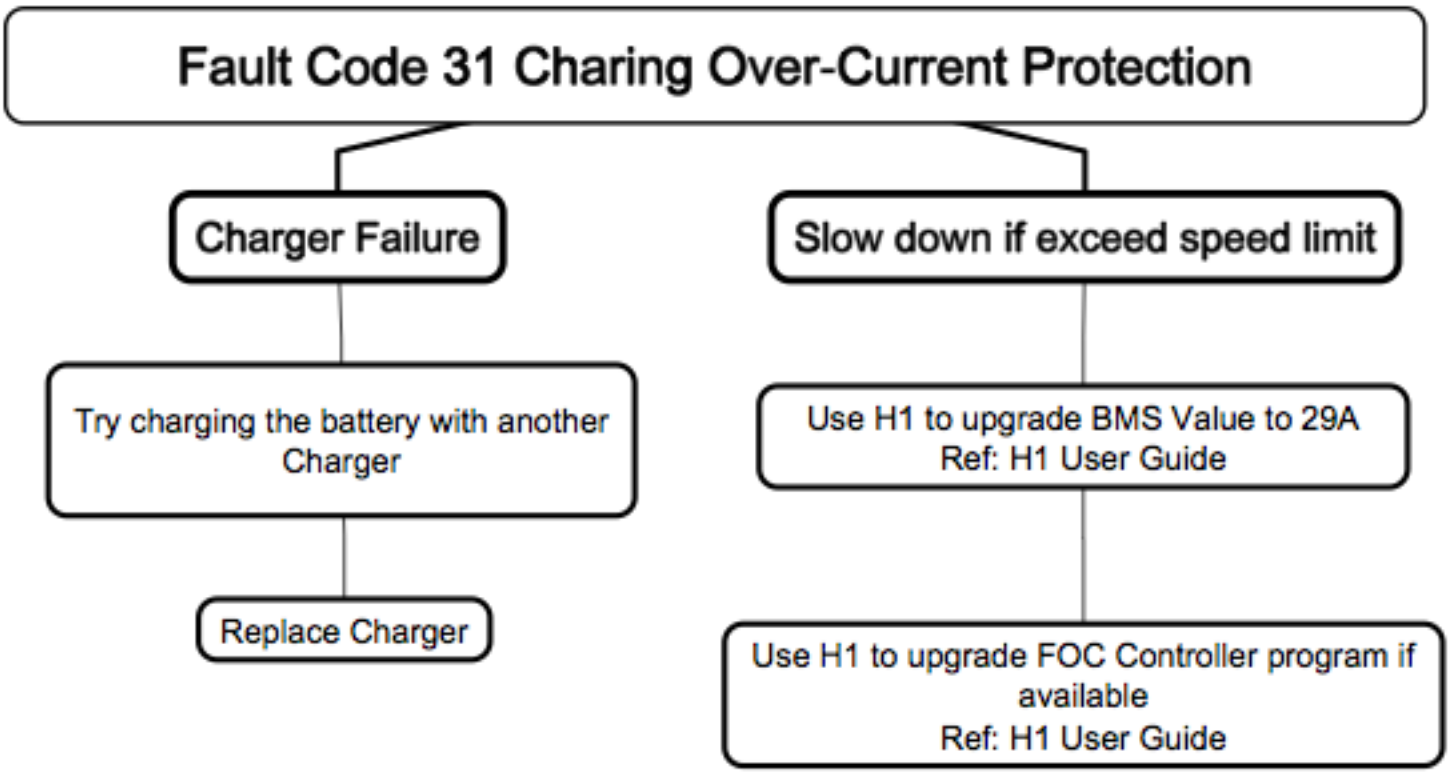
Diagnostic Code - 30 on display





Diagnostic Code - 31 on display





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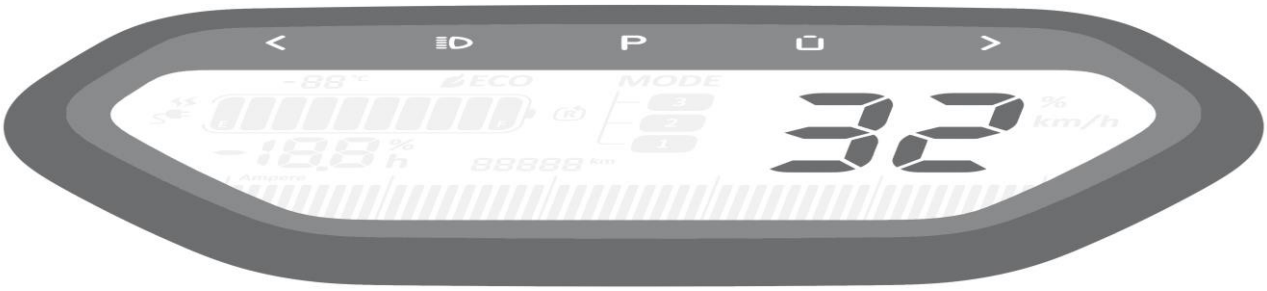

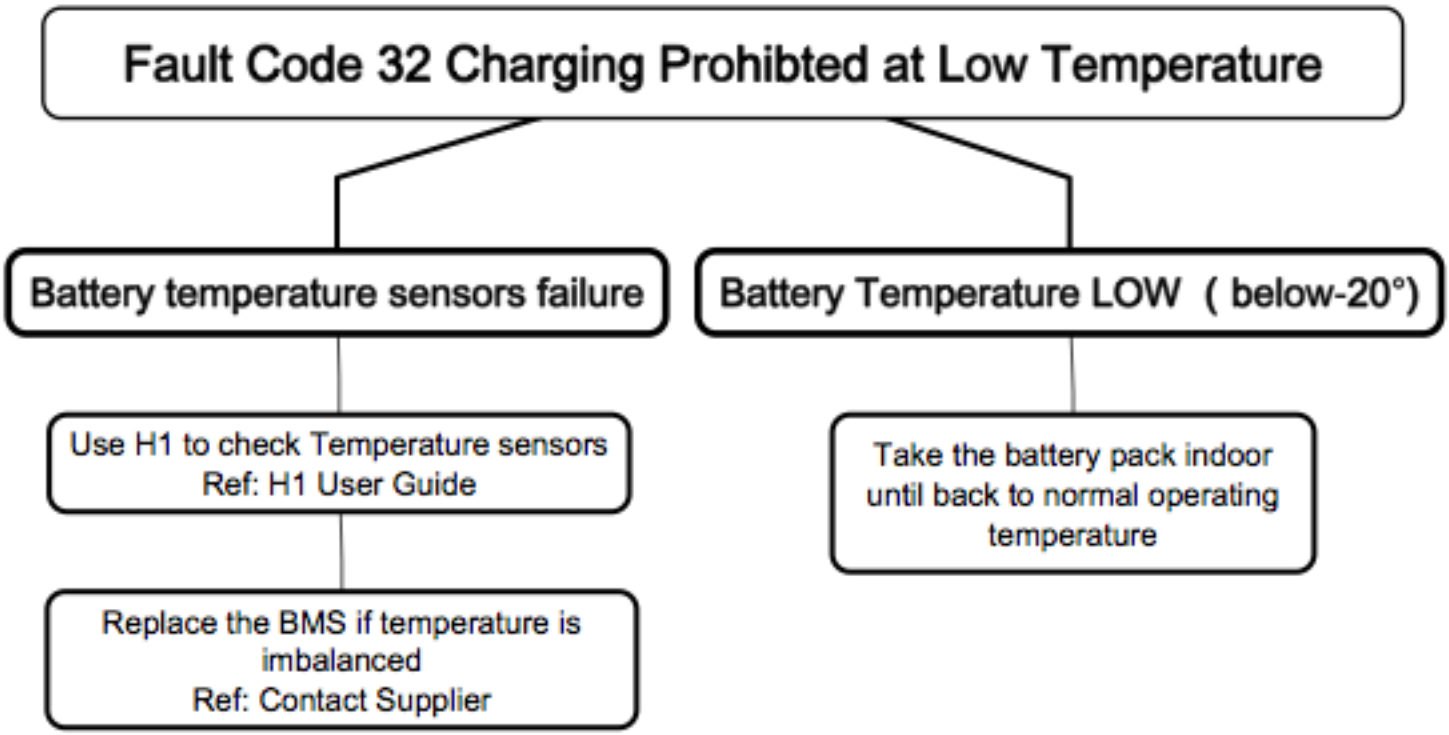

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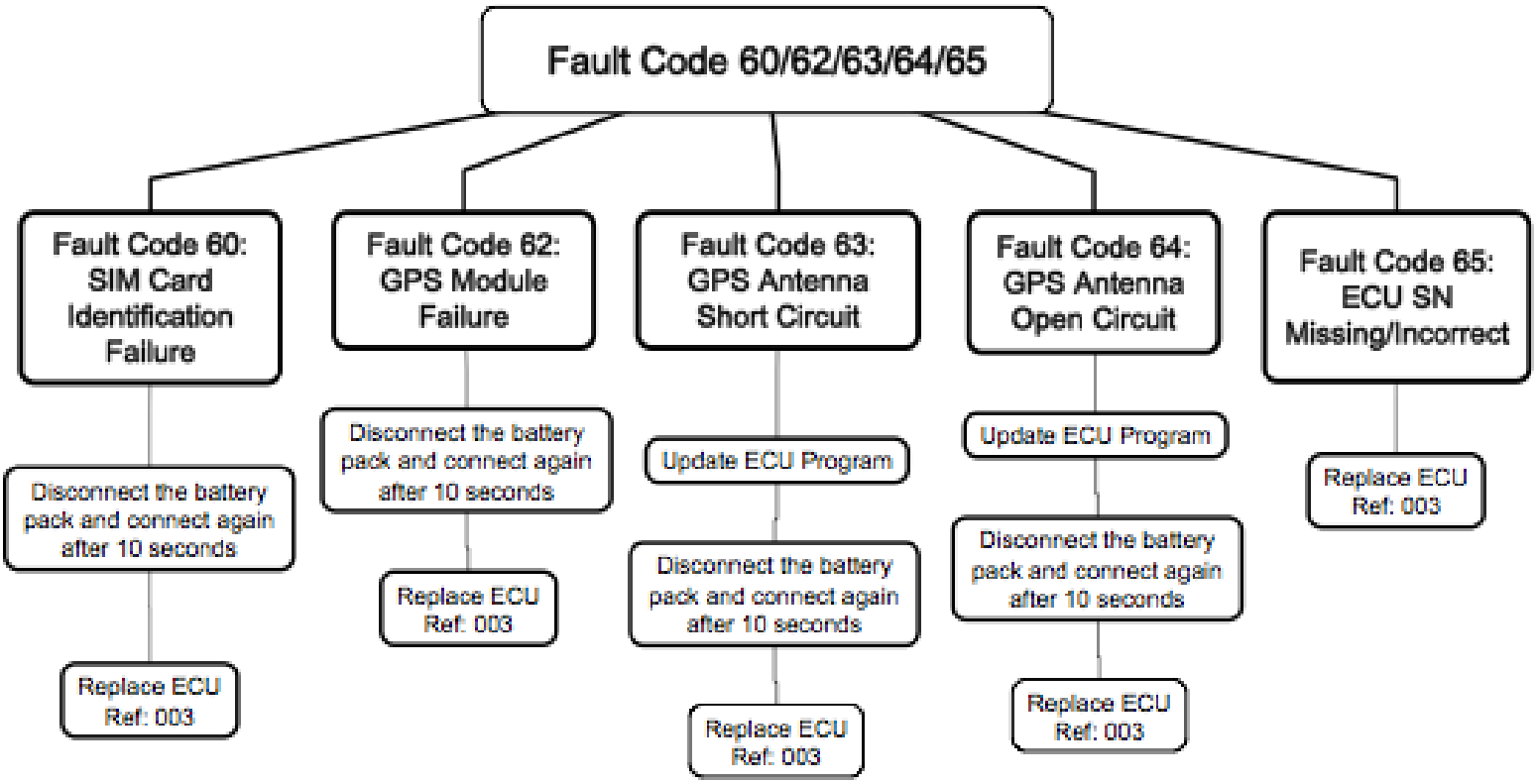

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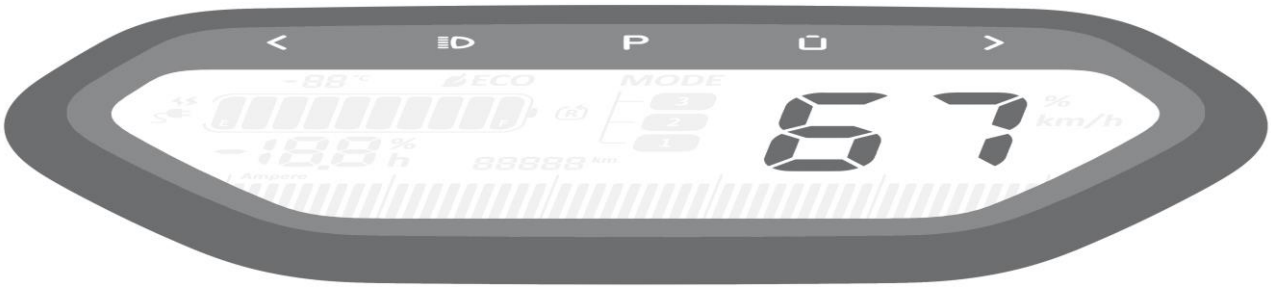

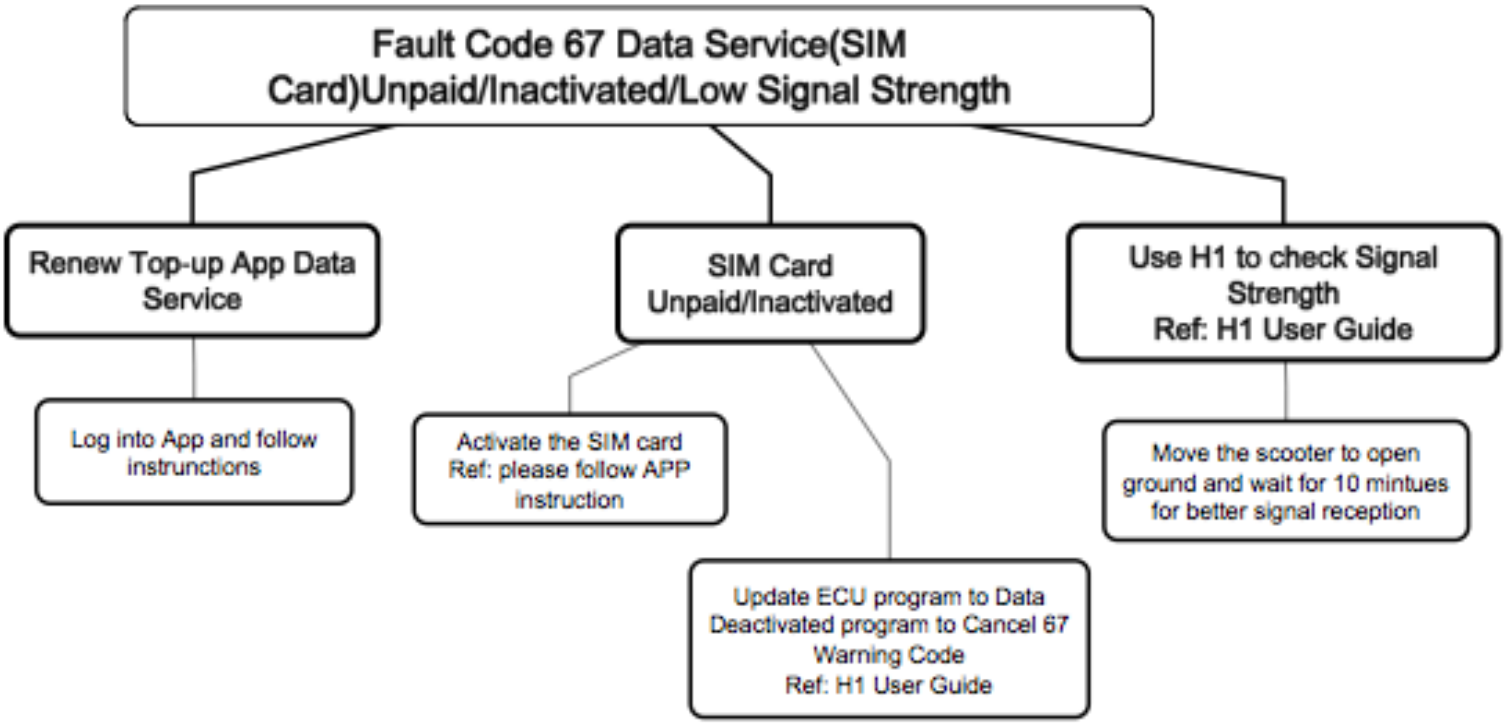

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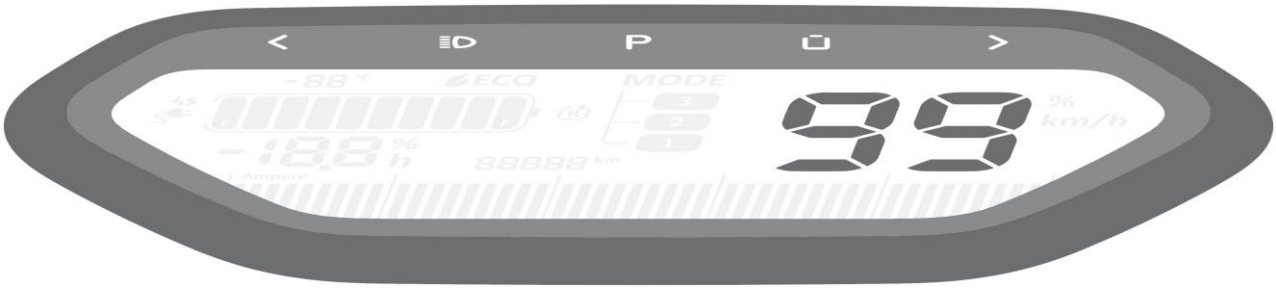

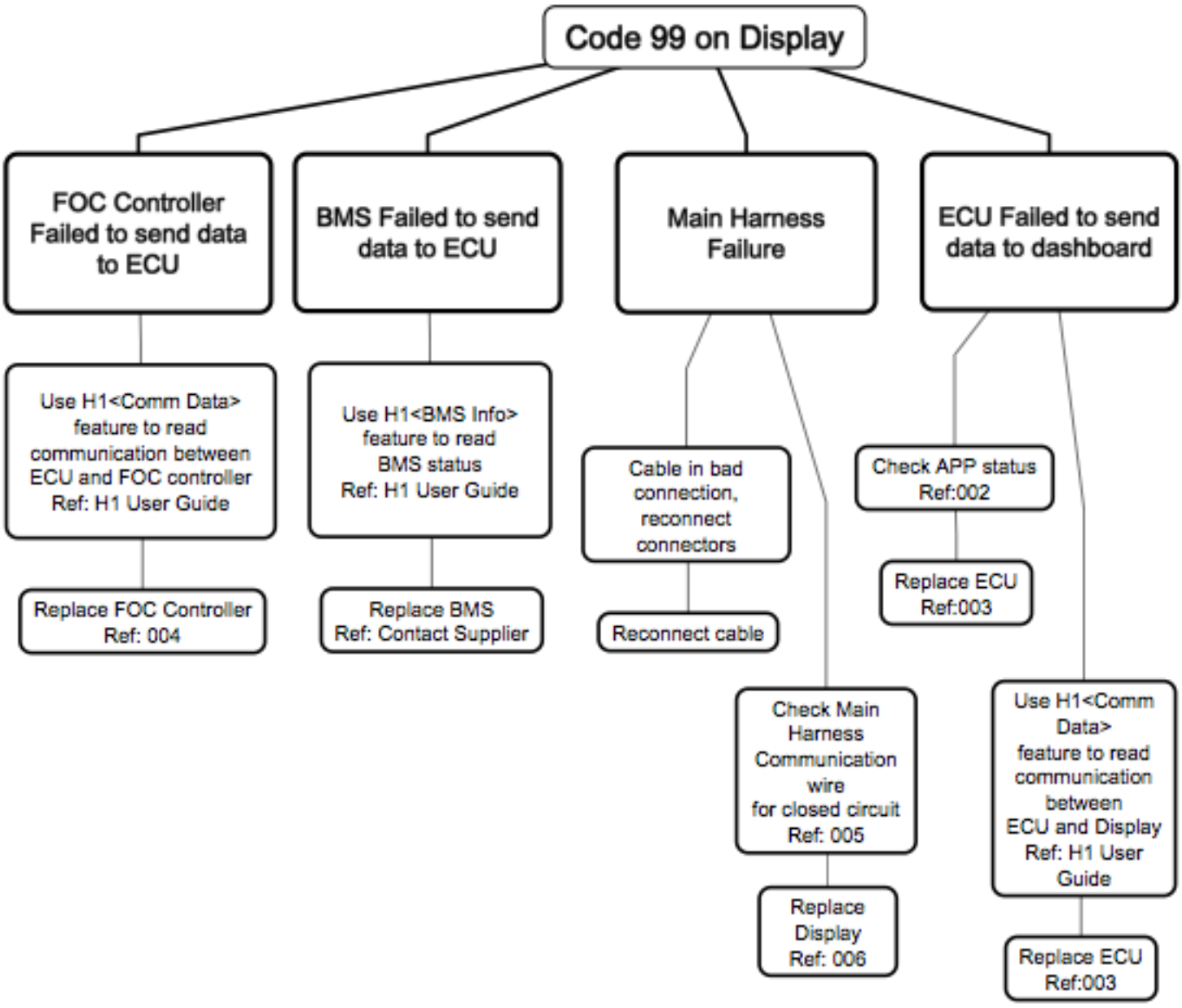

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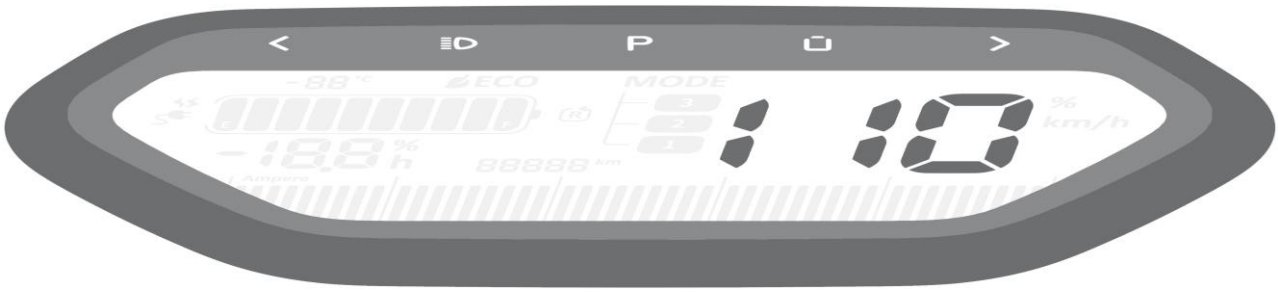
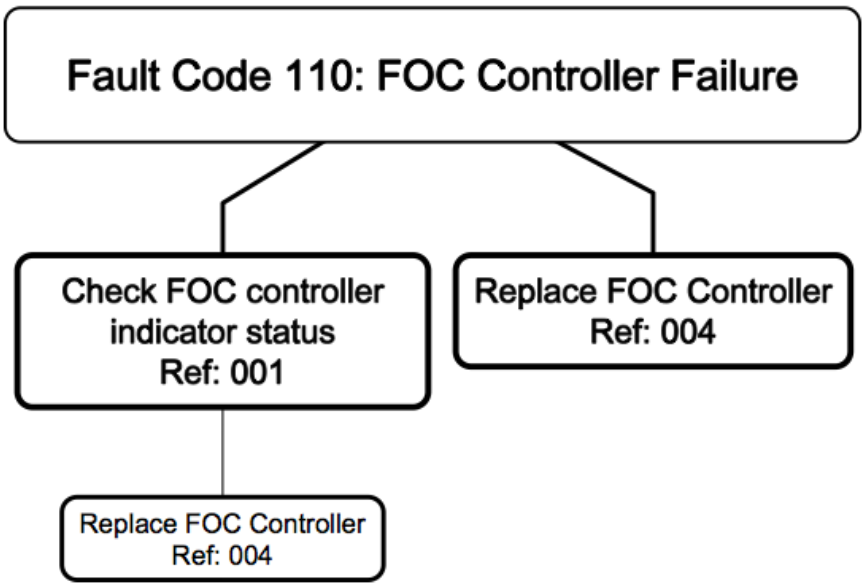
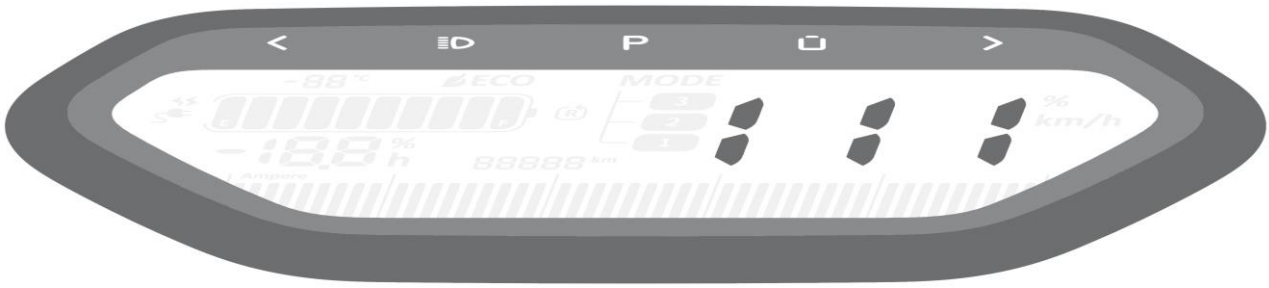




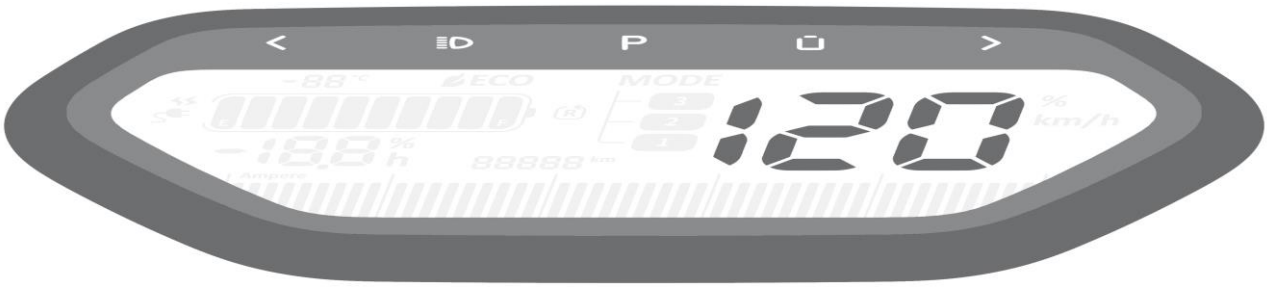
Diagnostic Code - 111 on display

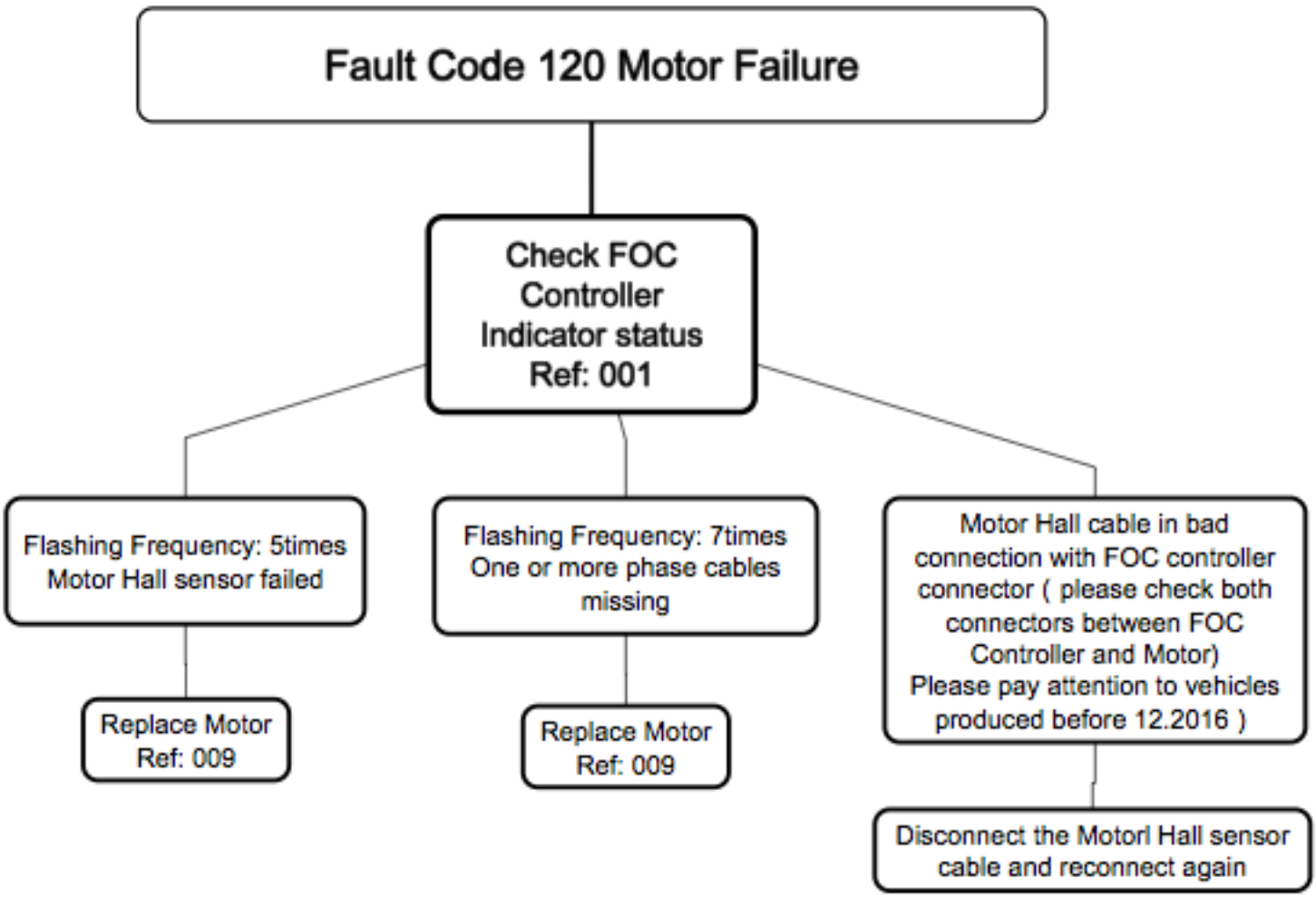


Fault Code 111 FOC : Controller Varif Verification

- Check Headlights, Turning Signal Lights, Tail Lights are working properly
  - Disconnect the battery pack, Reconnect after 10 seconds then restart the scooter
- Check FOC Controller Connector for damage
- Check circuit is closed(FOC Controller<>Alarm) Ref: 007
  Check FOC indicator status: turn the power to ON and indicator should flash once, if indicator doesn't flash at all after turning the power ON, then check orange wire for closed circuit.
  - Replace Alarm Ref: 008
- Check circuit is closed(FOC Controller<>ECU) Ref: 005
- Check Motor Hall Cable Connector for tighteness and damage
  - Disconnect the connetor, check if all PINs are normal, Reconnect again

Diagnostic Code - 120 on display





Diagnostic Code - 130/131/132/133 on display

Fault Code 130/131/132/133

Fault Code 130 : Battery Over Discharged Warning

Battery LOW, Check battery voltages by H1 and charge the battery
Ref: H1 User Guide

Replace the battery if voltage differences between cell is grater than 0.05V

Fault Code 131: Over-Current Discharging Warning

Check the Current of battery with H1
Ref: H1 User Guide

Fault Code 132 : Battery Over-temperature (55°+) Warning

Disconnect the battery pack and check the battery temperature with H1, cool down before using
Ref: H1 User Guide

Replace the BMS if temperature is imbalanced
Ref: Contact Supplier

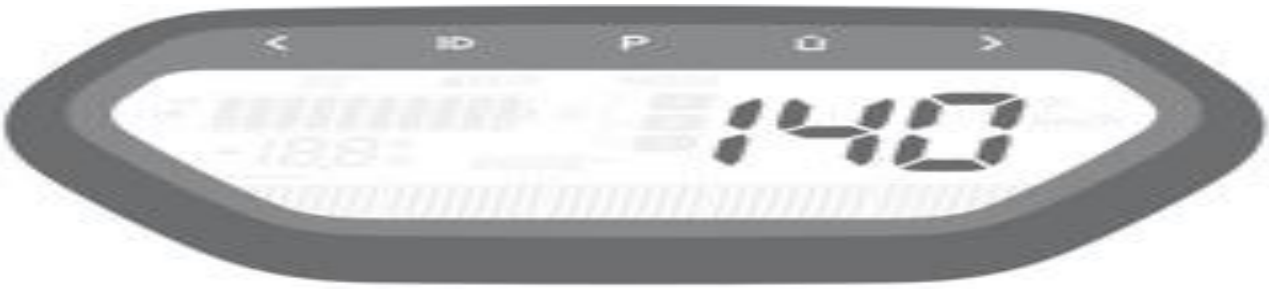
Fault Code 133: Battery Charge/Discharge prohibted -20° enviroments

Disconnect the battery pack and check the battery temperature with H1
Ref: H1 User Guide

Take the battery back indoor, Charge/Discharge will recover at -15°

Replace the BMS if temperature is imbalanced
Ref: Contact Supplier

Diagnostic Code - 140 on display



Fault Code 140: Hall Cable Sensor Failure

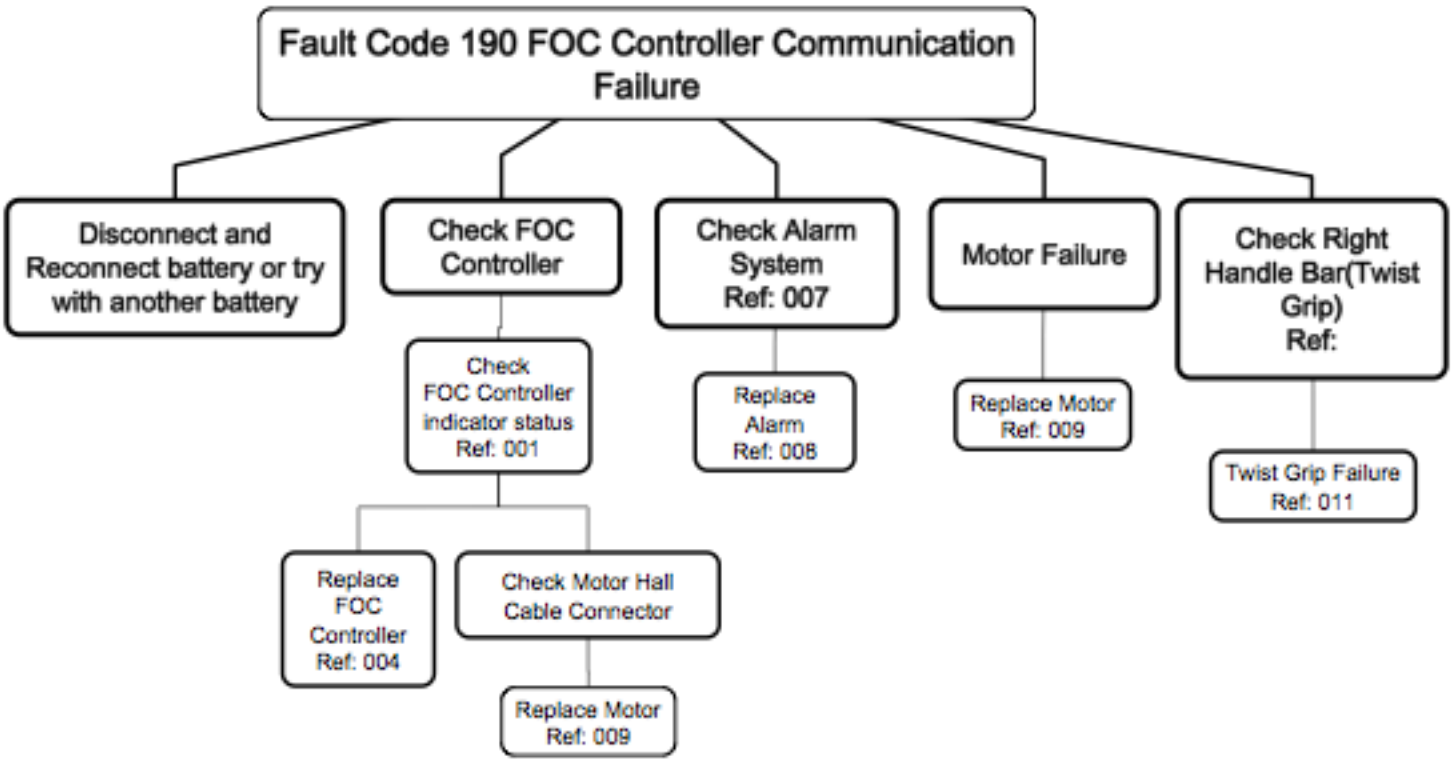
- Check travel distance of twist grip cable and adjust accordingly Ref: 010
- Release the Twist grip fully and turn the power on
- if fault code shows only occasionally, install FOC controller fixing bracket
  - Check main harness <>FOC Controller connector Pin 27 for damage
- Check Hall Cable sensor
  - Check connectors are connected properlly
  - Disconnect Hall Cable Sensor and check if fault code is cancelled
    - Replace Hall Cable Sensor Ref: 012
  - check voltages of hall cable sensor when throttle is Not-applied and when fully applied Ref: 011
    - Replace Hall Cable Sensor Ref: 012

Diagnostic Code - 161 on display

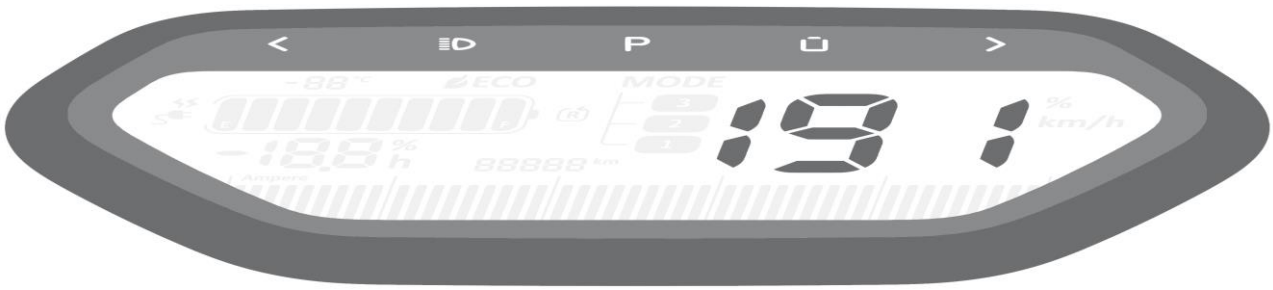
Fault Code 161: Scooter has been locked by remote command

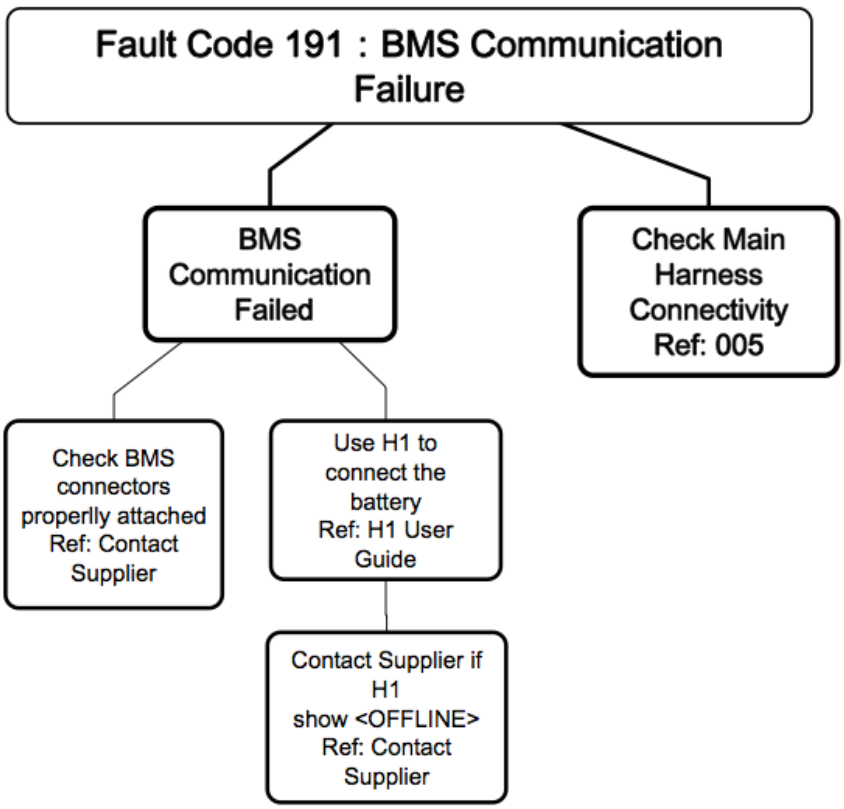
Contact Supplier to unlock

Diagnostic Code - 190 on display



Diagnostic Code - 191 on display





Regular Maintenance Checklist

Overview

The 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	
	Side/Central Stands	
	Handrail	
	Left and right handles	
Braking system	Brake fluid volume	
	Assembly clearance	
	Abnormal brake noise	
	Response time	
	Braking distance	
	Appearance inspection	

Regular Maintenance Checklist

Electronic Components	Power lock	
	Lighting inspection	
	Instrument inspection	
	Left/Right Combination Switches	
	Alarm and horn	
	EBS energy recovery	
	Controller inspection	
Wheel-hub motor	Wire connection and appearance	
	Inspection for abnormal noise	
	Startup inspection	
	Tolerance and deformation	
Software	ECU software version	
	FOC software version	

Regular Maintenance Checklist

Inspection 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.

Inspection of Brake Pads wearing

- Check the brake pads for wearing.
- The brake pad of a brake 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 disc.

Inspection of 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.

Inspection of Brake fluid

- The leaking brake 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 fluid because they are not compatible with each other.
- Do not let foreign objects enter into the braking system in filling the fluid reservoir with the brake fluid.
- Check the brake pads for wearing if the brake fluid level is around the lower-limit horizontal scale
- A low level of the brake fluid may result from wearing of the brake pads that causes push-out of the brake caliper piston.
- Check the entire system for leakage if a low level of the brake fluid occurs without wearing of the brake pads.

- Lift up the scooter with the central stand.Turn the steering handle reversely to make the fluid reservoir horizontal, and check the brake fluid level in the front brake fluid reservoir through the glass observation hole.

Regular Maintenance Checklist

Inspection of Brake Lamp Switch and Front/Rear Brake

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

- Make sure that the brake lamp turns on in actual application of the brake.Replace the front/rear brake switch or other faulty components in the braking system, if turn-on of the front brake switch is not synchronous with brake application

Inspection of Lamp System and Switches

- Turn on the ignition switch to check left and right combination switches
- Make sure that the corresponding light turns on to actual switch application
- Make sure that the light brightness and flashing are normal
- Make sure the horn sounding is normal
- Make sure the startup button operates normally
- The speed regulation switch operates normally, and the switching between high and low beams is normal

Inspection of Side Stand

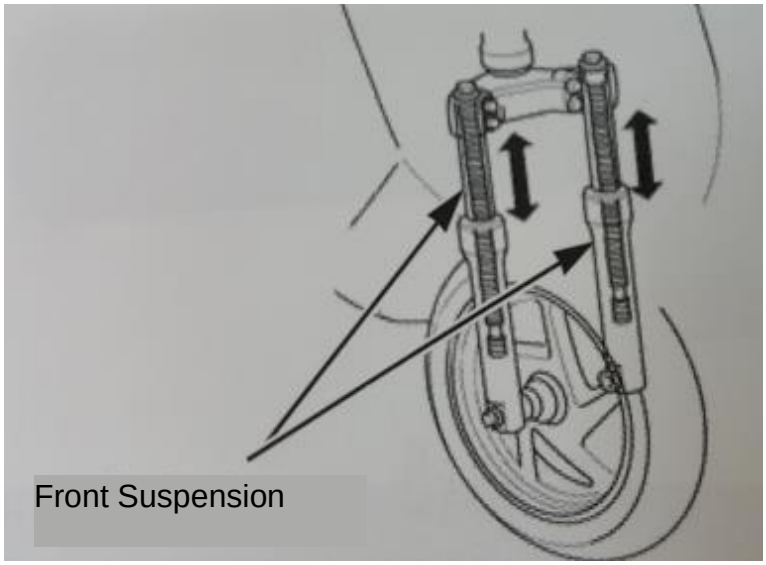
- Lift up the scooter with the Central Stands.
- Check the Side Stand spring for damages or tension loss.
- Check the Side Stand assembly for free movement.
- Lubricate the Side Stand pivot where necessary.

Regular Maintenance Checklist

Inspection of Suspension system

Front suspension

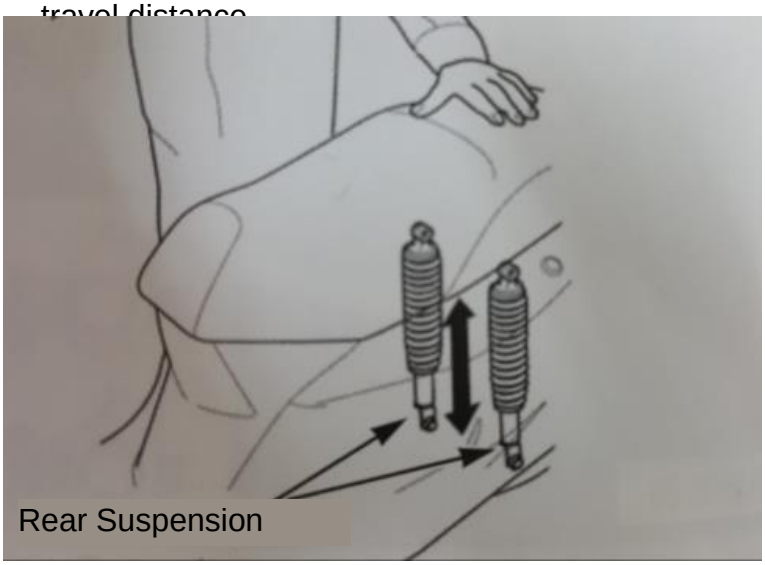
- Operate the front brake and check the front suspension system by pressing down the handle bar for several times to check motion of the fork.
- Check the entire assembly for leakage, damages or loosened fasteners.
- Replace damaged components that can not be repaired.
- Tighten all the nuts and bolts.



Front Suspension

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 Central Stands.
- Hold both sides of the rear shock absorber and try to move it leftward and rightward to check free travel distance.



Rear Suspension

Regular Maintenance Checklist

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.

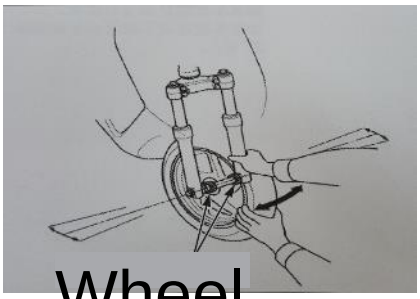
Inspection and maintenance of fasteners

Tightened section and fastener name	Tightening Torque (Nm)
Installation screws on the front hydraulic brake plate	8Nm
Tightening bolts on the front shock absorber	28Nm
Tightening bolts on the fixed handle seat cover	8Nm
Tightening bolts on the welded steering handle assembly	52Nm
Front axle	60Nm
Installation screws on the rear hydraulic brake plate	8Nm
Self-locking nuts on the motor	75Nm
Top bolts on the rear shock absorber	44Nm
Bottom bolts on the rear shock absorber	28Nm
Tightening screws on the hex flange of rear handrail	28Nm
Tightening nuts on the fixed shaft of rear bottom fork	60Nm

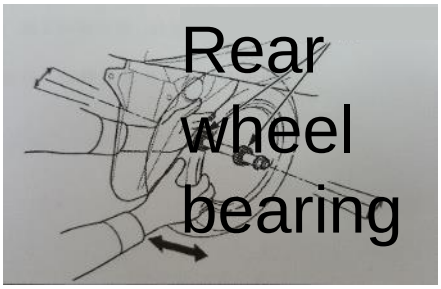
Regular Maintenance Checklist

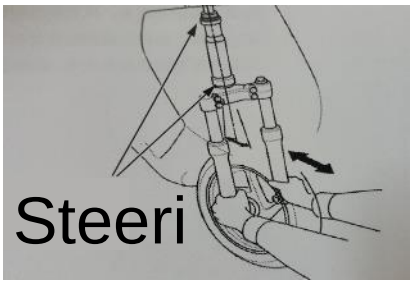
Inspection of Wheels and Tires

- Support the scooter with the Central Stands.
- Lift up the Front/Rear Wheel to check range of the free travel.
- Hold the Front/Rear Wheel and try to move it leftward and rightward to check the front wheel bearing for wearing.
- Replace the Front/Rear Wheel bearing if it becomes loosened.
- Turn the wheel to make sure that it can be rotated smoothly without an abnormal noise.
- The Front/Rear Wheel bearing should be inspected as long as there are suspicious abnormal conditions.



Wheel bearing

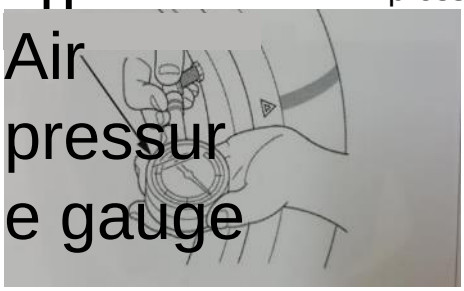




Steering column

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

Front tire	
Rear tire	26-32psi



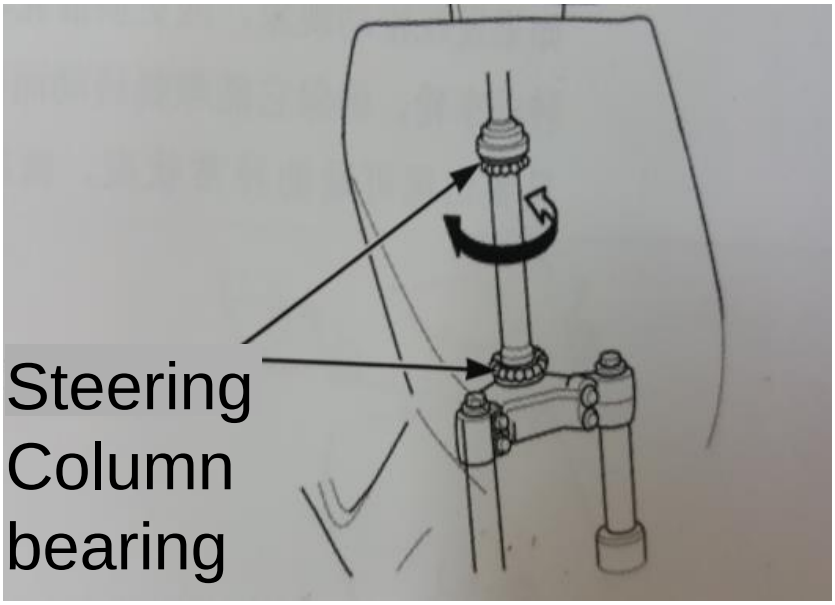
Air pressure gauge

- Check the tire for cuts, embedded nails or other damages.
- Check flatness of the front and rear wheels.
- Check tread depth.

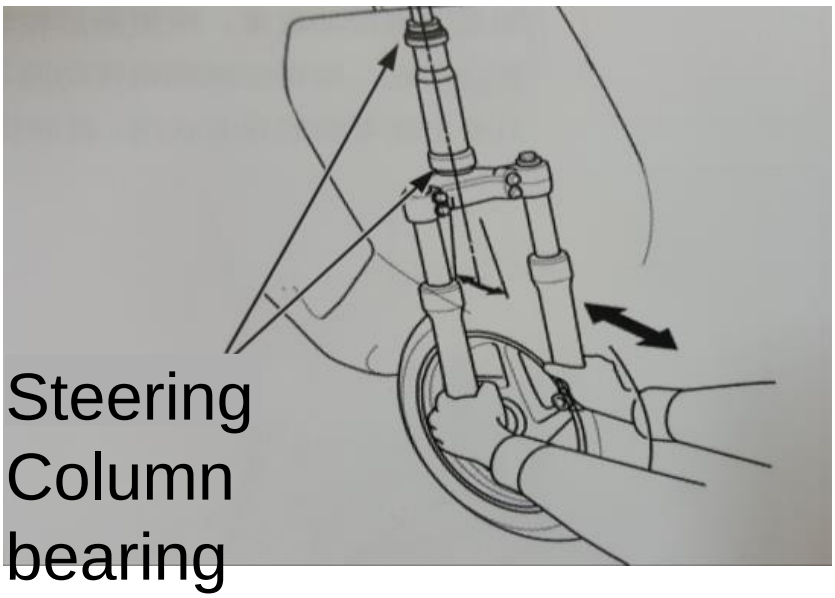
Regular Maintenance Checklist

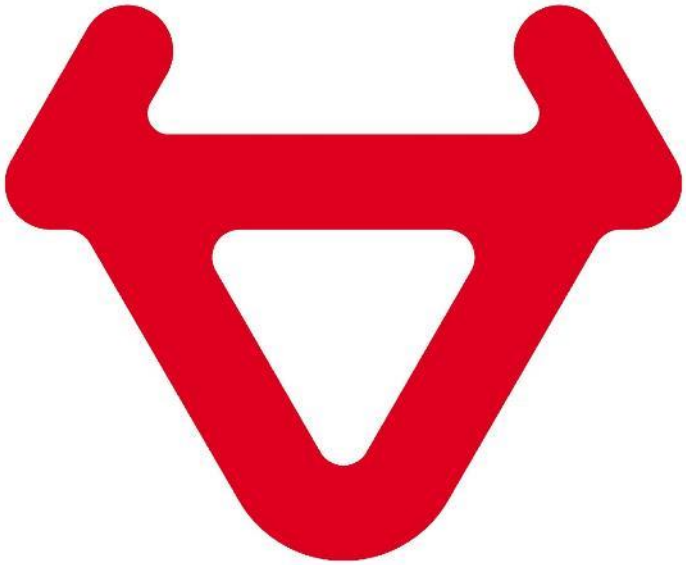
Steering column bearing

- Support the scooter with Central Stands, 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 back and forth to check the steering column bearing for wearing.
- Check the steering column bearing if the steering column is displaced vertically.





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