



MQI GT Scooter

Dual batteries + Intelligent Charger(TBD)

Service Manual



Jiangsu Niu Electric Technology Co. Ltd



Foreword

Key points in maintenance of Niu MGT 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 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 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

Foreword	2
Maintenance Rules and Important notes	5
Cable connector inspection	6
Scooter Identification	7
Specifications	8
Part Names	11
Parts Removal and Installation Procedure	17
Front Wheel	41
Front Fork	43
Steering Handlebar	45
Rear Wheel/ Rear Suspension	47
Brake System	50
Lithium battery/charger	57
BCS and Fast Charger	65
Electrical System	
Electronic components	66
Diagnostic Code	110
Regular Maintenance Checklist	130



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 front central panel.



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





Overall specifications :

Item		Specifications
Dimensions	LeMGTh × width × height	1969x738x1160mm
	Wheelbase	1380mm
	Complete vehicle kerb mass	109Kg
	Ground clearance of the seat cushion	815mm
	Ground clearance	180mm
Scooter frame	Type of the scooter frame	The pedal type made with combined welding of panels and pipes
	Specifications of the front tire	90/90-14 (NGTS Same)
	Type of the front rim	2.15X14 aluminum alloy
	Air pressure of the front tire	200KPa
	Specification of the rear tire	110/80-14 (NGTS same)
	Type of the rear wheel	2.5X14 wheel-hub motor
	Air pressure of the rear tire	225KPa
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	Single sided hydraulic brake with dual pistons
	Type of the rear brake	Opposed sided hydraulic brake with dual pistons
	CBS	Division of brake force: Front: 30% Rear: 70%



Specifications of the motor controller system

Item		Specifications
Motor	Motor type	Brushless permanent-magnet motor
	Controller type	FOC vector control
	Rated voltage	DC48V
	Rated power	3000W
	Maximum motor power	3200W
	Maximum motor torque	138 NM
Controller	Rated voltage	DC48V
	Maximum input current	80A

Specifications of the battery/charger

Item		Specifications
Propulsion Battery	Type	Packed lithium battery
	Rated voltage	48V DC
	Rated capacity	2*31Ah-P (Sport) -Confirmed Status 2*42PAh-P (Pro) -TBD
	Mass	2*11KG=22KG
Environmental Propulsion Performance	Energy Consumption	35Wh/KM
	Electric Range	134KM
Intelligent Charger	Output voltage	3000W
	Max Output current	



Specifications of the braking system

Item	Standard value (mm)	Minimum Thickness(mm)
Diameter of the front brake disc	φ220mm	-
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	φ180mm	-
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	

Specifications of the Lighting/Display/switch

Electric system	
Item	Specifications
Front headlight	12V LED
Turn signal lamp	12V LED
Rear tail lamp	12V LED
Brake lamp	12V LED
Display	12V LCD display
Central control unit(ECU)	12V
USB charging interface	5V



Part Names

Scooter body





Parts Removal and Installation Procedure

Procedures for removal and installation of scooter body panels are described in this section. The ignition switch and main switch (if applicable) 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.

Front Part

Section 1

1.1 Front body lower lip : Pull it out gently directly

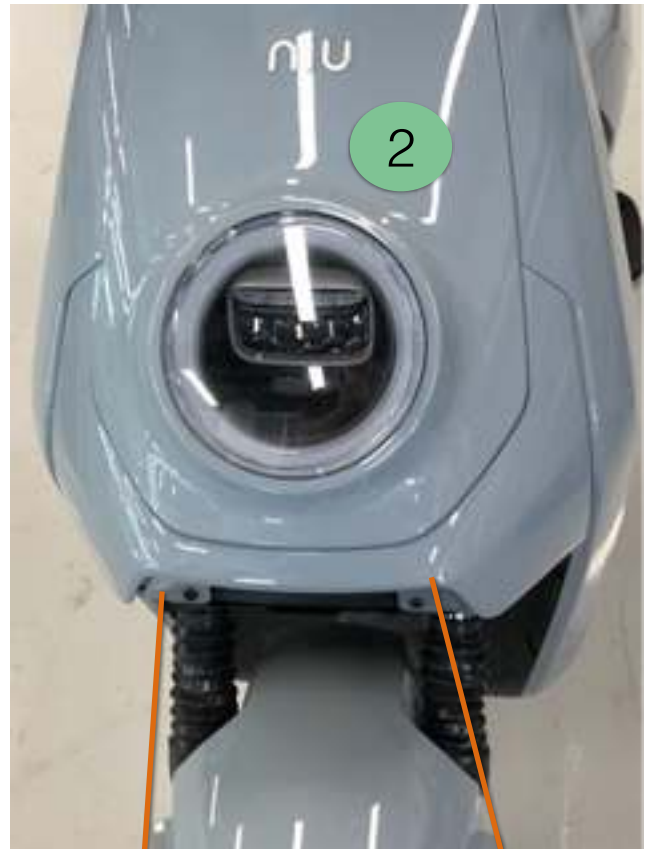
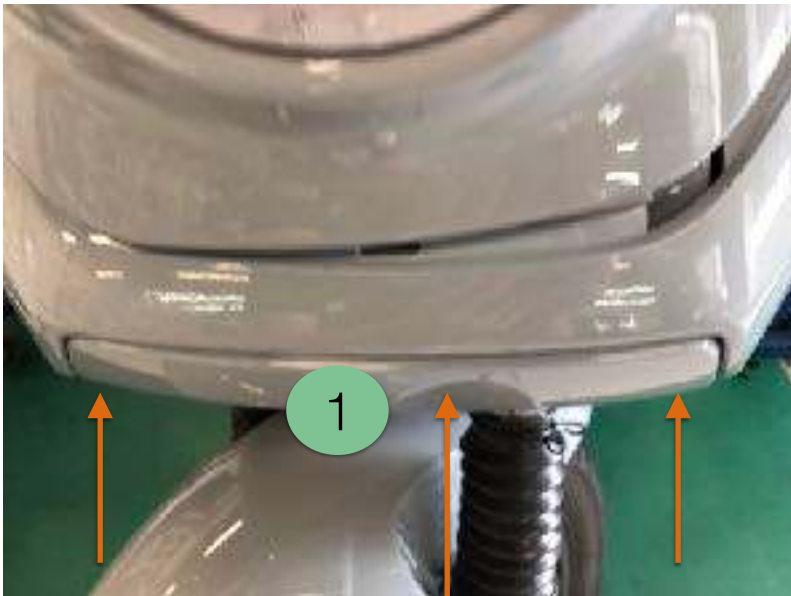
1.2 Remove two bottom screws then pull out it.

1

Front Panel: Remove two bottom screws then lift the panel up to open it.

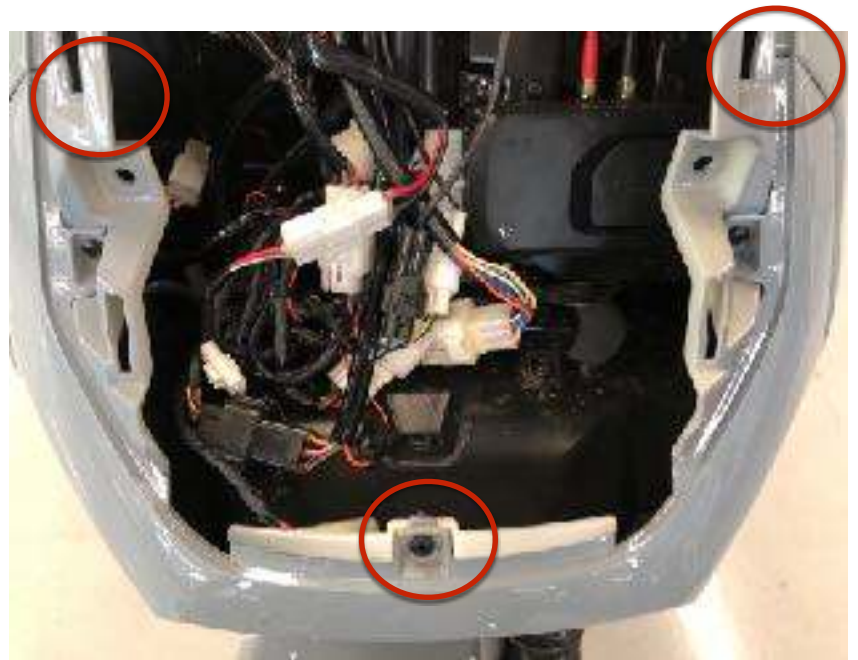
2

Mount: Follow as the reverse order.





Headlight



Section 2

2.1 Front Body upside cover:

cover:

remove three screws then pull out it.

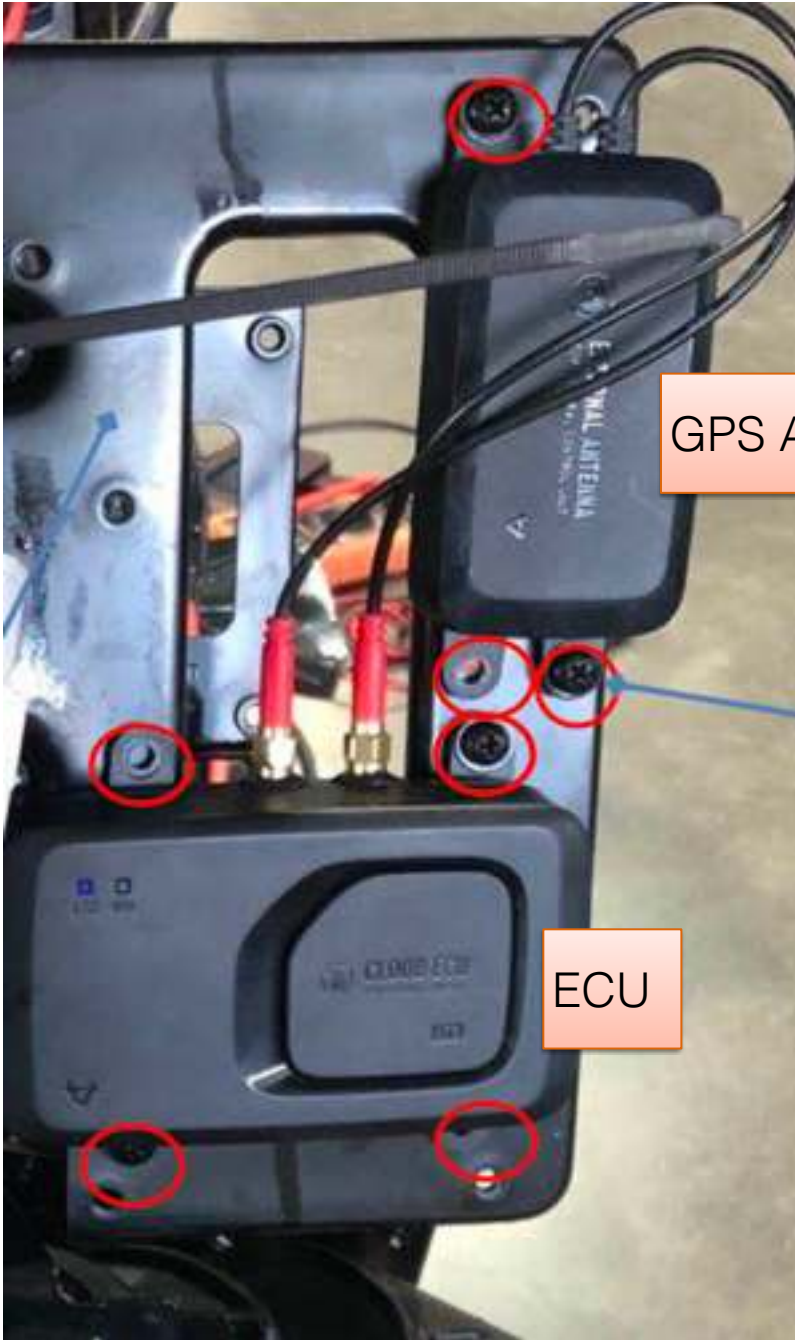
Mount: Follow as the reverse order.



Front Body

Front Body upside cover

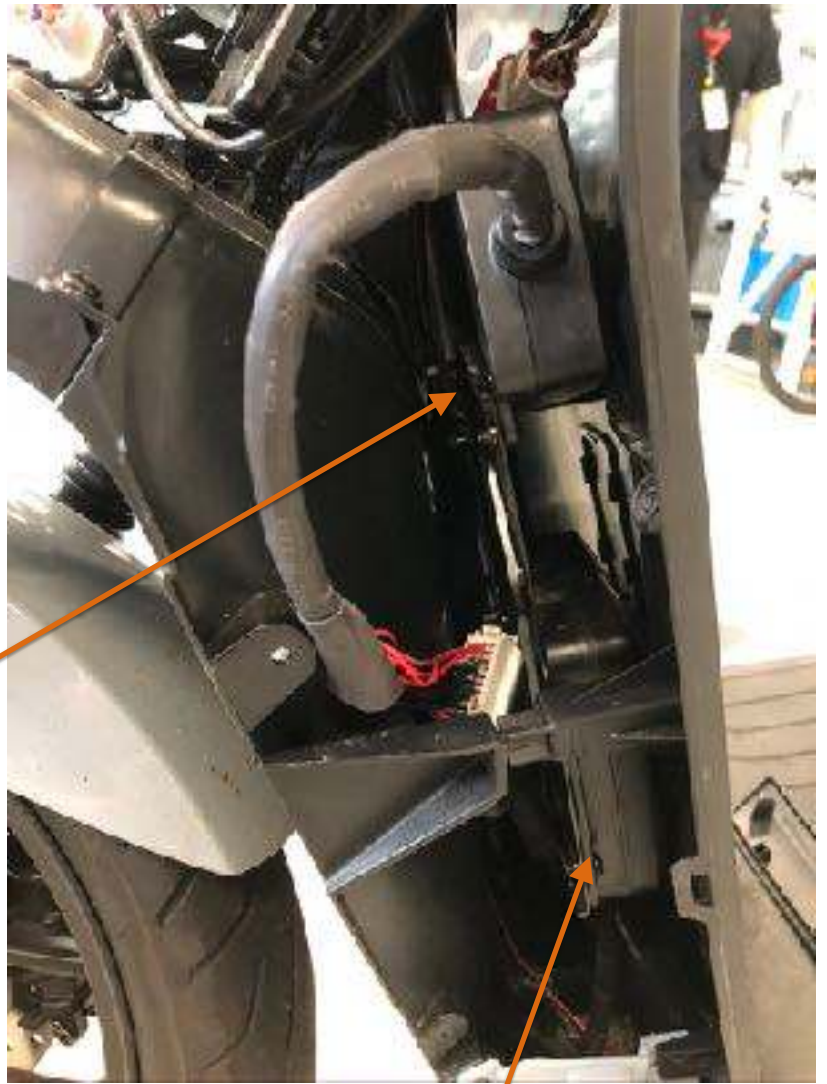
Front Body lower lip



GPS Antenna

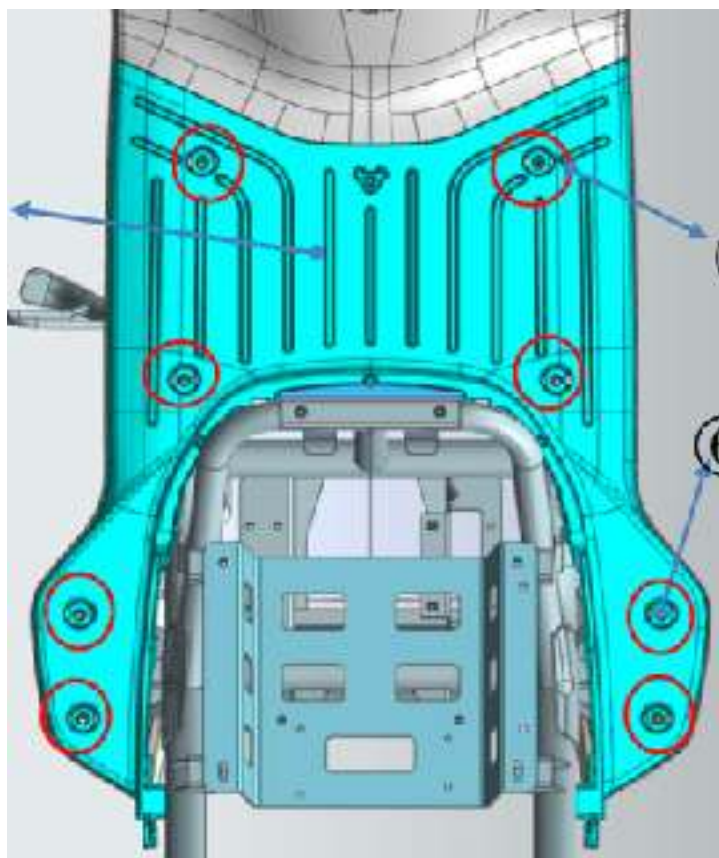
ECU

Related Screws: M5*12
Qty:7 pcs
Tighten Torque: 4-7 N*M



LCU

Lock Controller



Remove the bottom panel by unscrew the 8 screws

Related Screws: M6*20 (40201078)
Qty:8 pcs
Tighten Torque: 1-2N*M

Mount: Follow as the reverse order.

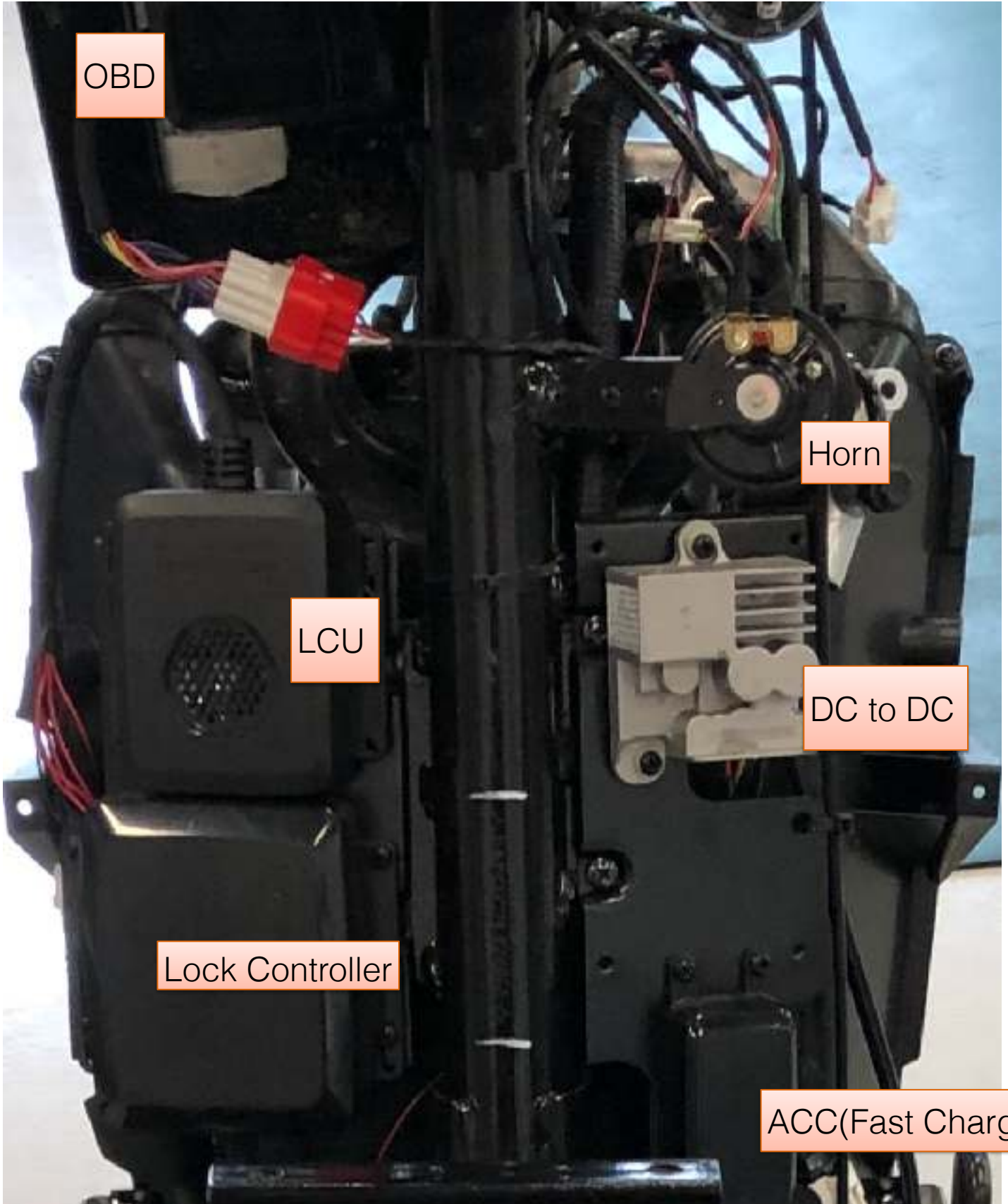


Remove the front guard panel
Mount: Follow as the reverse order.

Related Screws: ST4.8X16 (40206006)

Qty:6 Pcs

Tighten Torque: 1-2N*M



OBD

Horn

LCU

DC to DC

Lock Controller

ACC(Fast Charge)

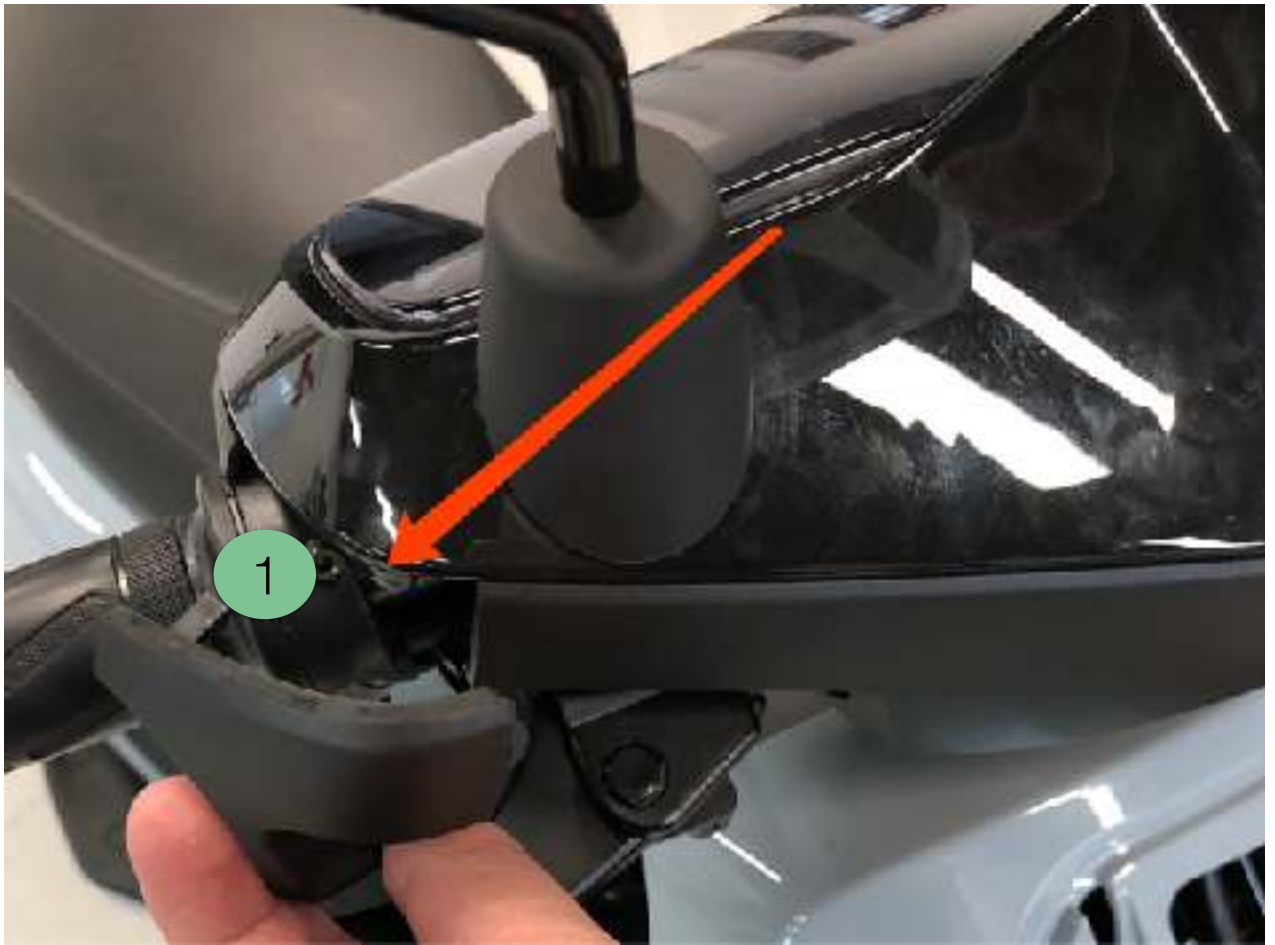
Dashboard Removal



Section 3 Dashboard
3.1 Dashboard Cover Block
remove 8 screws then
pull left dashboard cover and rear cover
out. 1 2

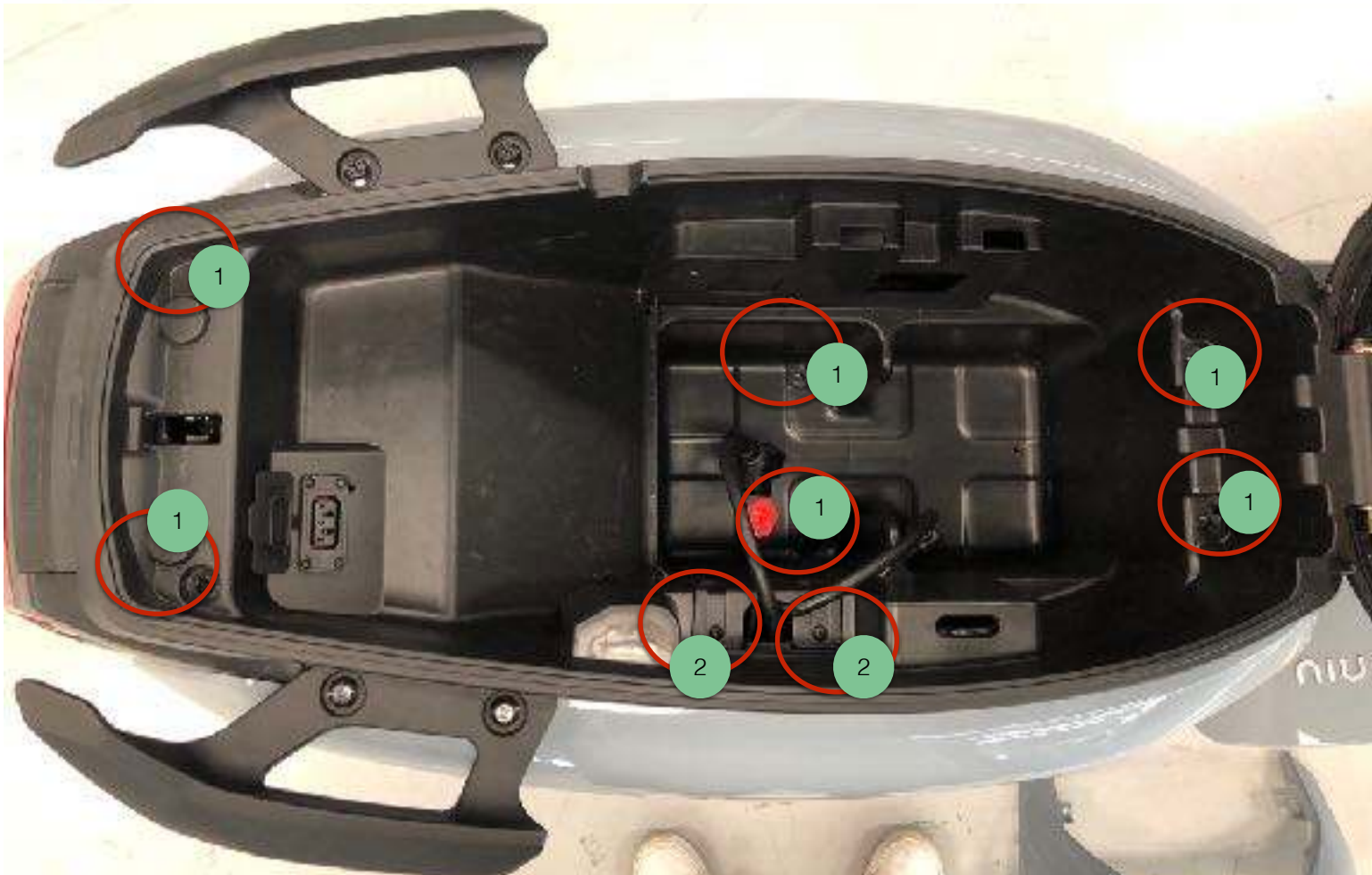
Mount: Follow as the reverse order.







Rear Part



Section 4 Seat and Plug lock bracket

4.1 Seat: Remove six screws then pull out ¹.

4.2 Plug Lock bracket: Remove the two screws ².

Mount: Follow as the reverse order.



Fan Controller

Section 5

5.1 Fan: Remove 4 screws then remove it.

5.2 Fan Controller: Disconnect the connector.
Disconnect the charging port and 485 port.

Mount: Follow as the reverse order.

Related Screws: M4*12 (40201078)

Qty:8 pcs

Tighten Torque: 1-2N*M



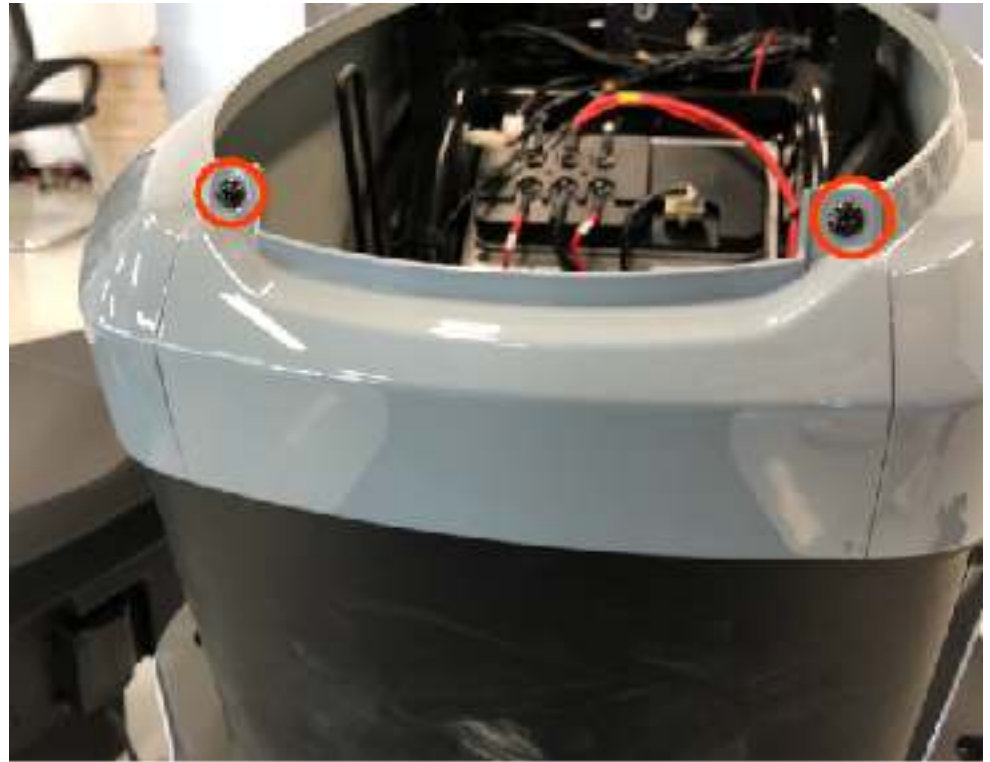
Handrail

5.3 Remove four Hexagon flange bolts marked in the guide photo



5.4 Pull out the Handrail





Section 6

6.1 Central guard panel plate: Remove it by unscrewing two screws.

6.2 Central guard panel: Remove it by unscrewing six screws.

And disconnect the connector of left and right decoration lamps.

Mount: Follow as the reverse order.

1

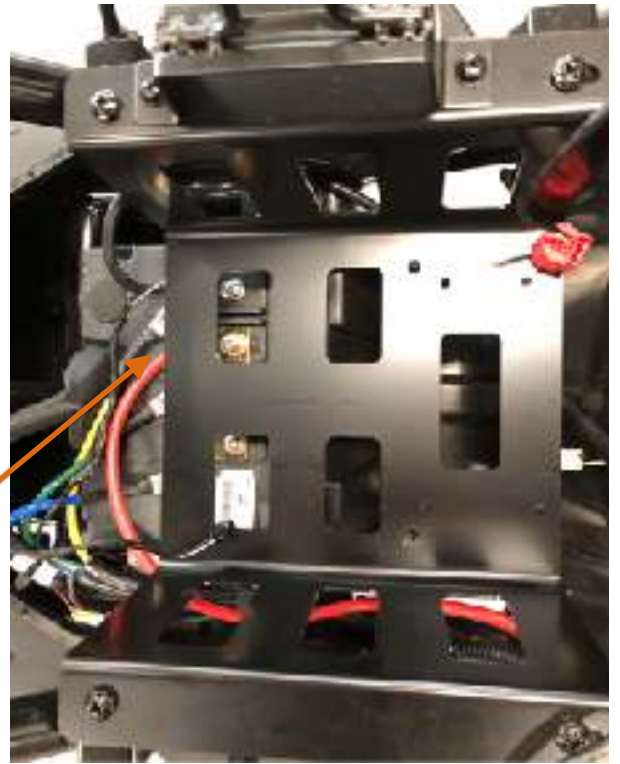




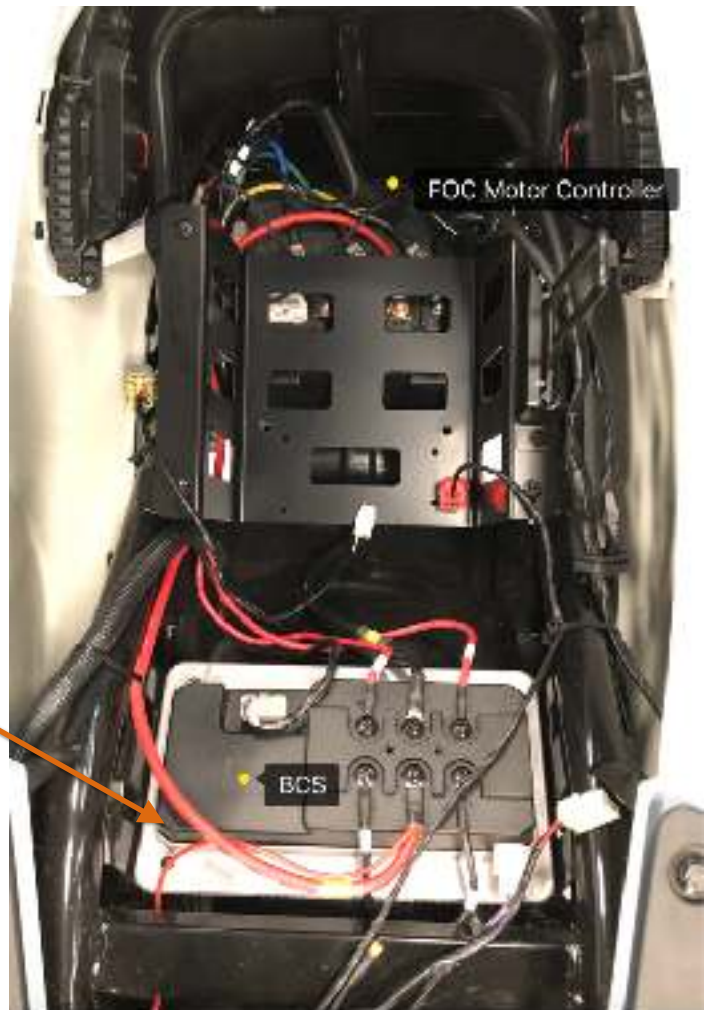
Disconnect the side lamp connector and remove the central guard.



Rear Parts+Central Guard W/Left and right side lamp+ Rear Light Assembly



FOC Controller



BCS



6.3 Remove the BCS

Mount: Follow as the reverse order.

Related Screws: M5*16
(40203011)

Qty:4 pcs

Tighten Torque: 3-5N*M



6.4 Remove the FOC controller

Mount: Follow as the reverse order.

Related Screws: M5*20
(40203002)

Qty:4 pcs

Tighten Torque: 3-5N*M





Brake System

Unscrew one cross recessed pan head bolt and two Hexagon flange bolts then take out front Brake System



Unscrew two Hexagon socket head stepped bolts marked in the guide photo



Unscrew two cross recessed pan head bolt and take out Rear Brake System





Section 7 Side Stand and Side Stand Switch

7.1 Unscrew the screw and unplug the connector marked in guide photo to take out the side stand switch



7.2 Unscrew the side stand screw and take out the side stand and spring (spring hook on the red circle when installation)





Section 8. Front Fender and Rear Fender

8.1 Unscrew two Hexagon flange bolts on the left and right sides then take out the Rear Fender



8.2 Unscrew two Cross recessed medium pan head bolts on the left and right sides then take out the Front Fender





Section 9. Motor

9.1 Unscrew two hexagon flange bolts on the left and right side



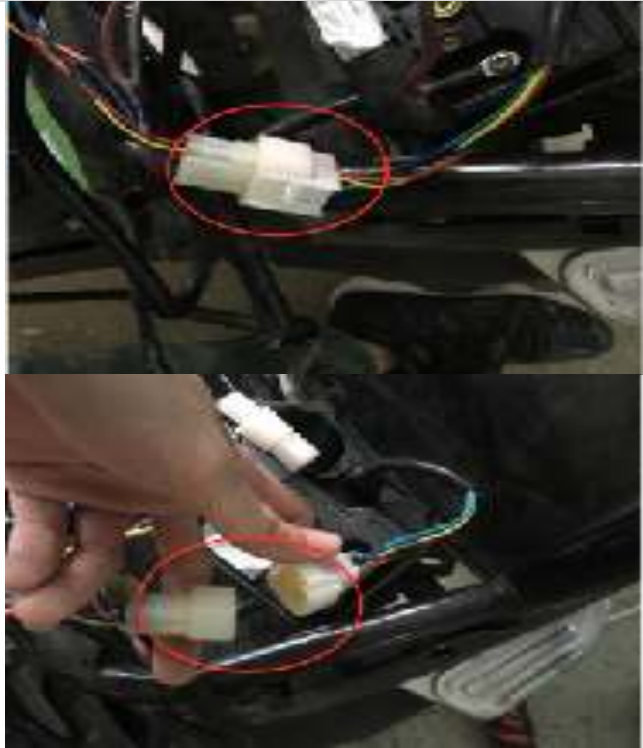
9.2 Remove the motor connectors on FOC controller





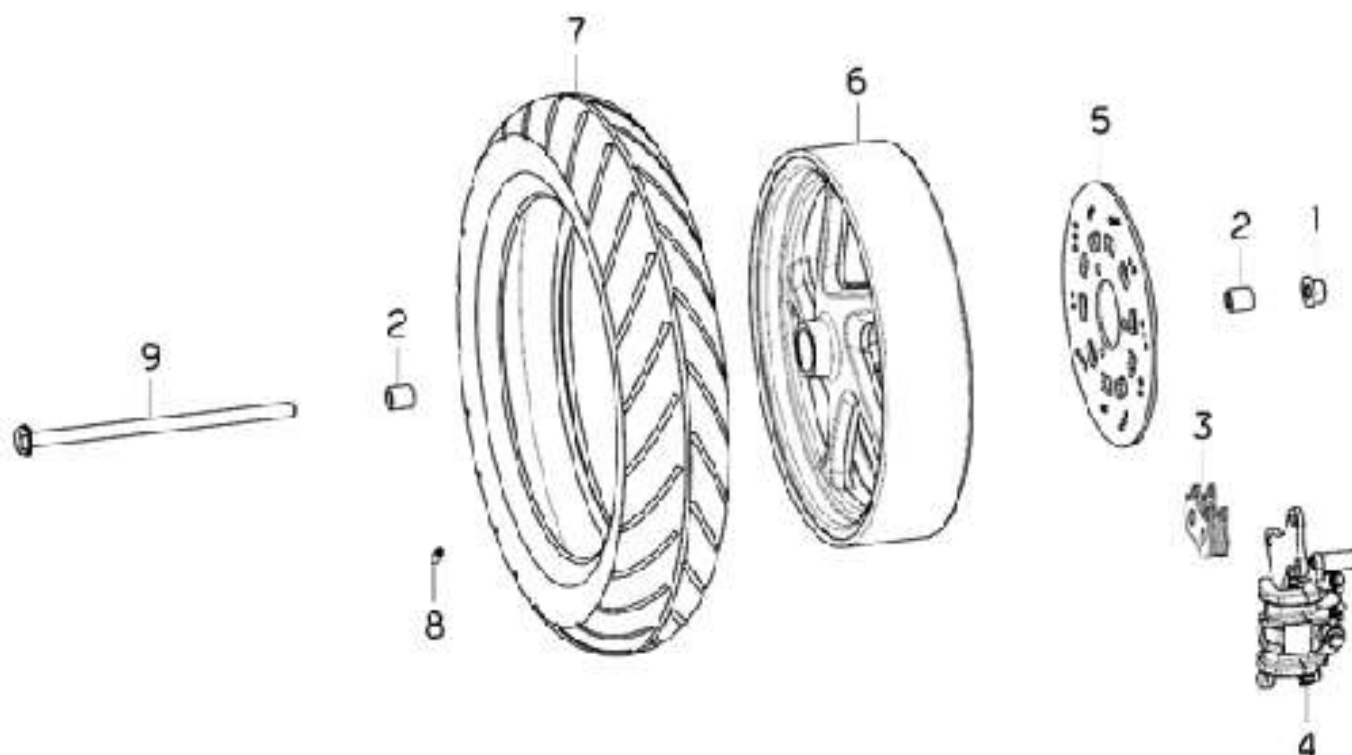
Section 9. Motor

9.3 Unplug the motor hall connector (Scooters produced before 2016 Dec) then pull out Motor





Front Wheel



1. Hexagon Nuts With Flange, Style 2-Fine Pitch Thread
2. Front Wheel Axle sleeve
3. Front disk brake lower pump brake pad
4. Front brake lower fluid pump
5. Front brake disk
6. Front Alloy Wheel
7. Front tire
8. Value
9. Front wheel axle

Specifications of the front tire: 90/90-12

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.

Disassembling

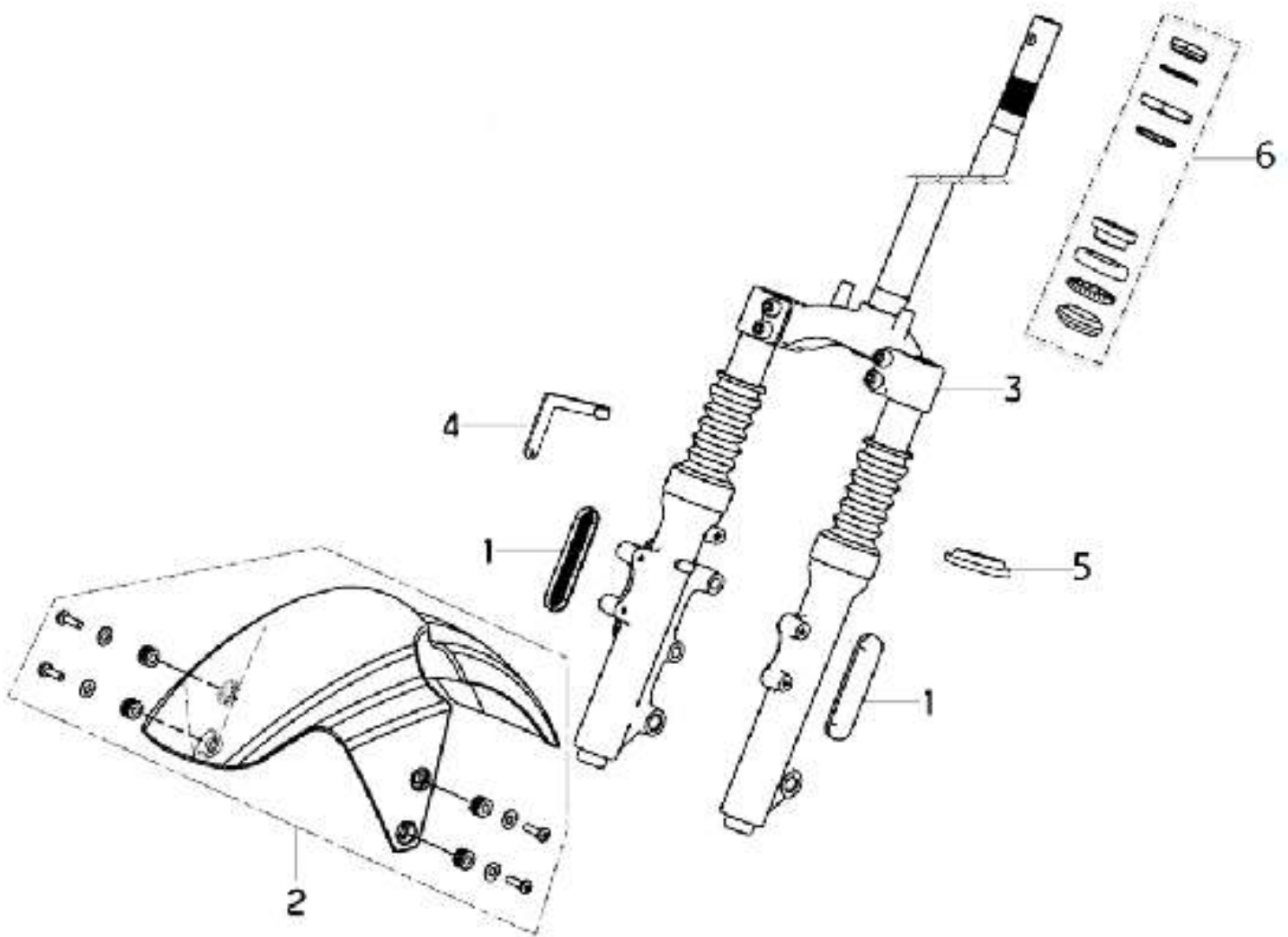
Coming soon...



Front Fork Assembly

Specifications of the Front Fork

Installation torque value for screw 4 in the figure: 28Nm



1. Front left and right reflectors 2 Front Fender 3 Front fork assembly including shock absorb 4 Fluid Tube Clip 5 – 6 7 pieces of direction 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.

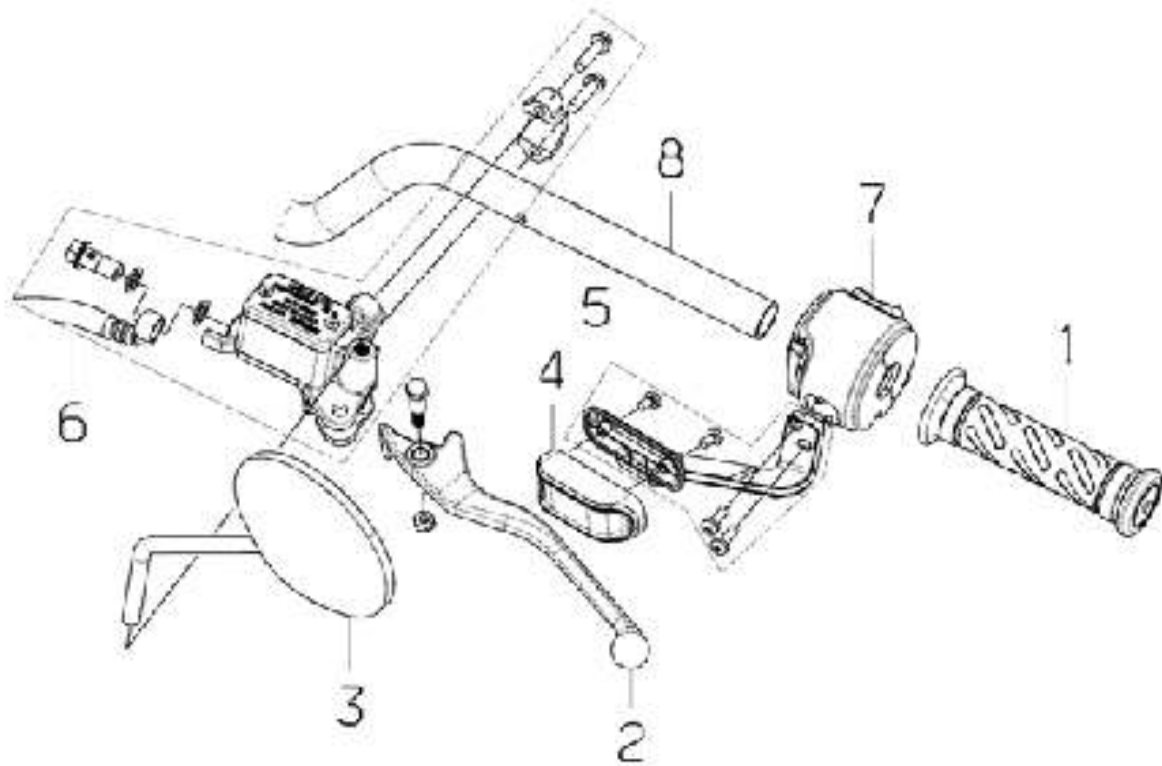
Tools:

Spanner for tightening bolts on the steering handle.

Dedicated bearing detacher.



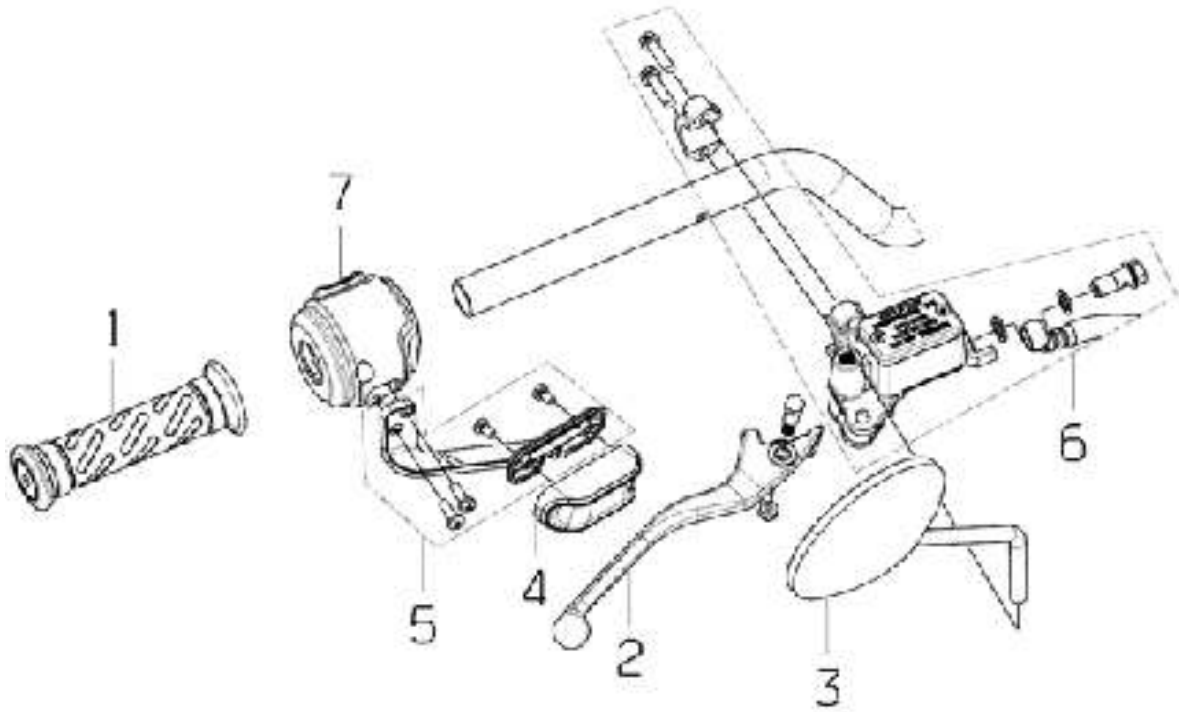
Steering Handlebar Left



1. Left handle 2. Brake level 3. Left review mirror 4 left turn signal assembly 5. Fixing bracket of turn signal 6 Rear disc brake Top Fluid Reservoir 7. Combination Switch 8 Handlebar



Steering Handlebar Right



1.Speed regulating steering handle 2. Brake level 3. Right review mirror 4 Right turn signal assembly 5. Fixing bracket of turn signal 6 Rear disc brake Top Fluid Reservoir 7. Right Combination Switch



Steering Handlebar Middle

1. Dashboard Windshield 2 MGT Dashboard Assembly 3 Dashboard Bracket 4 Handlebar fixing upper block 5 Hexagon socket head stepped bolt 6 Handlebar fixing lower block 7 T-Plate

Specifications of the Steering Handlebar

Installation torque value for screw 16 in the figure: 52Nm

Front/Rear Brake Lever free travel distance: 7-15mm

Twist Grip free travel distance: 5-10mm



Steering Handlebar

Failure diagnosis

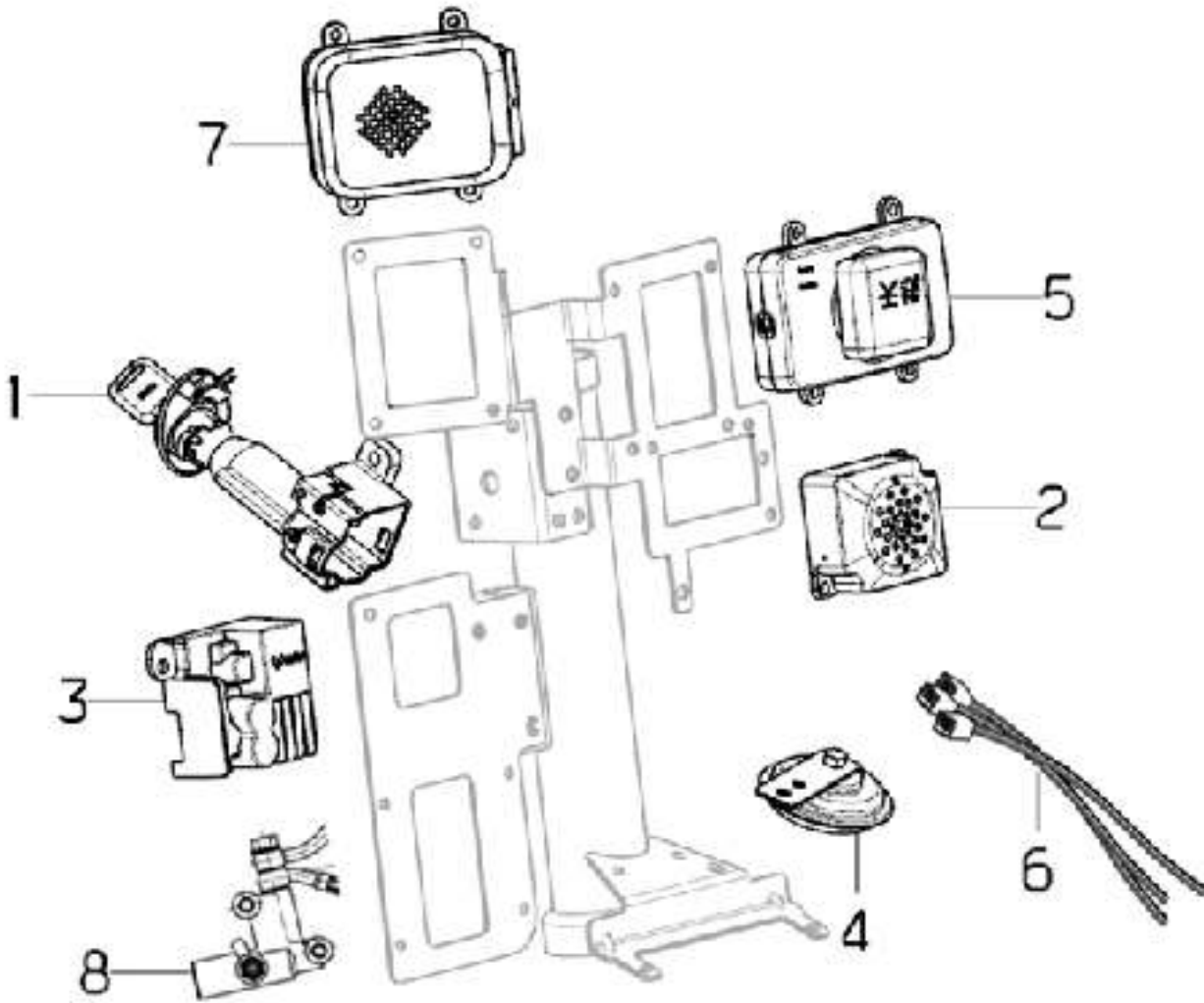
- The steering handle is difficult to turn.
- The steering handle bearing failed.
- The steering handle bearing is damaged.
- Steering is unstable
- The steering handle bearing is damaged.

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.



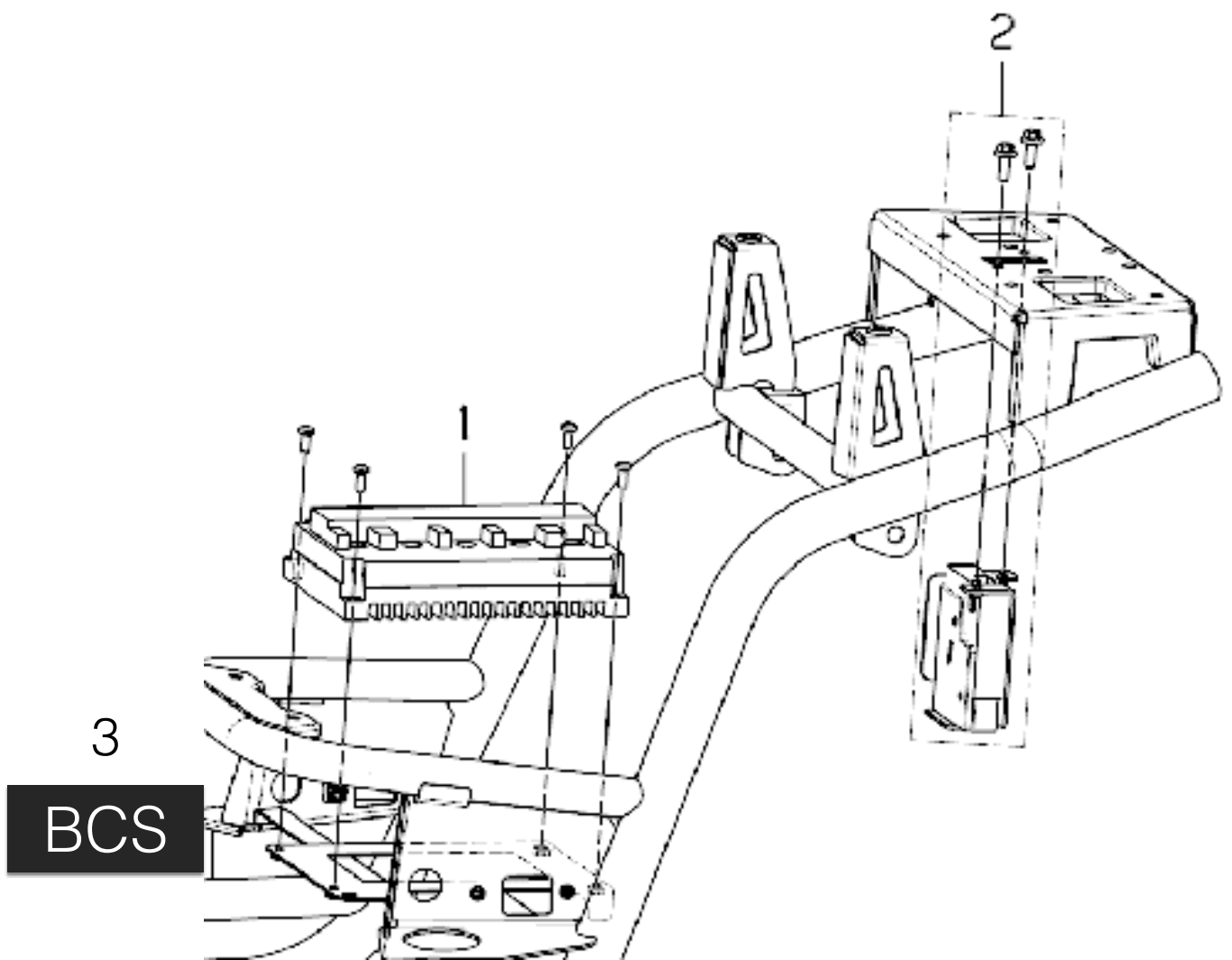
Electronic Components



1. Power Lock 2. Alarm 3.DC to DC A 4. Horn 5.U3LTE ECU 6. Main harness assembly
7.LCU 8.CBS



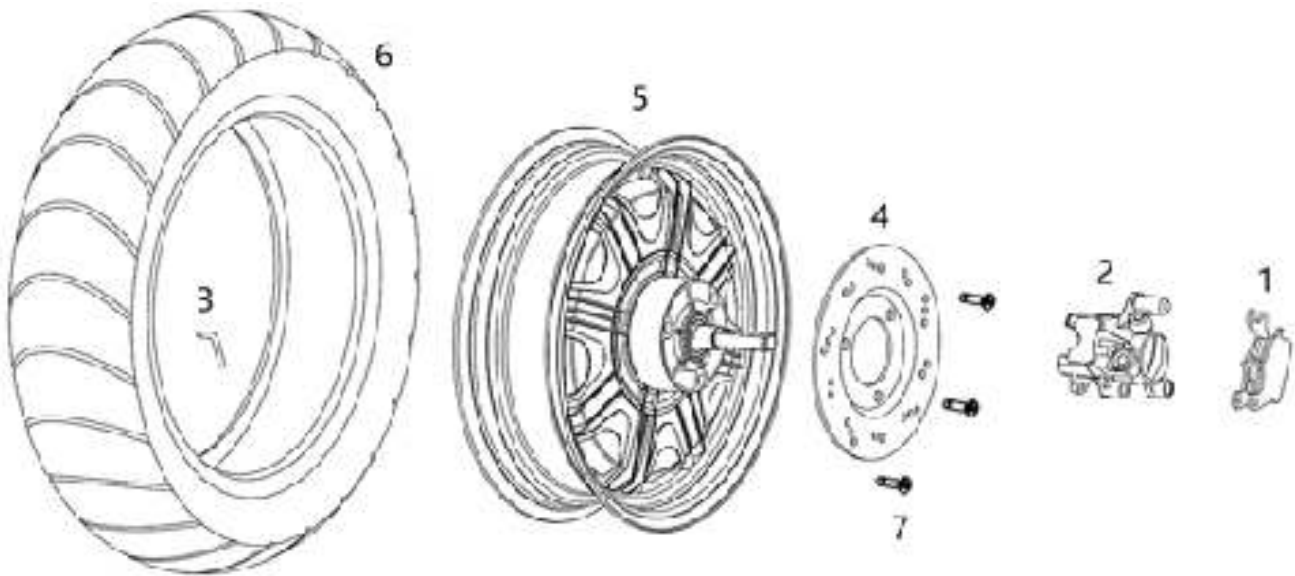
Rear components



1. FOC motor controller 2 Saddle Lock 3 BCS



Rear Wheel



1. Rear disc brake pad 2 Rear disc brake lower fluid pump 3 Valve 4 Rear brake disc 5 Motor (3000W) 6 Rear Tire

Diameter of the rear brake disc:
 $\phi 180\text{mm}$

Thickness of the rear brake disc: 3.5mm
Operating limit: 2.5mm

Torque value for Top Bolts on the rear shock absorber: 44Nm
Torque value for Bottom Bolts on the rear shock absorber: 28Nm



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.

Specifications of the Motor

Installation torque value for self-locking nut 1 in the figure: 75Nm

Motor oscillation value :

Vertical oscillation limit: 2.0mm

Lateral oscillation limit : 2.0mm



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

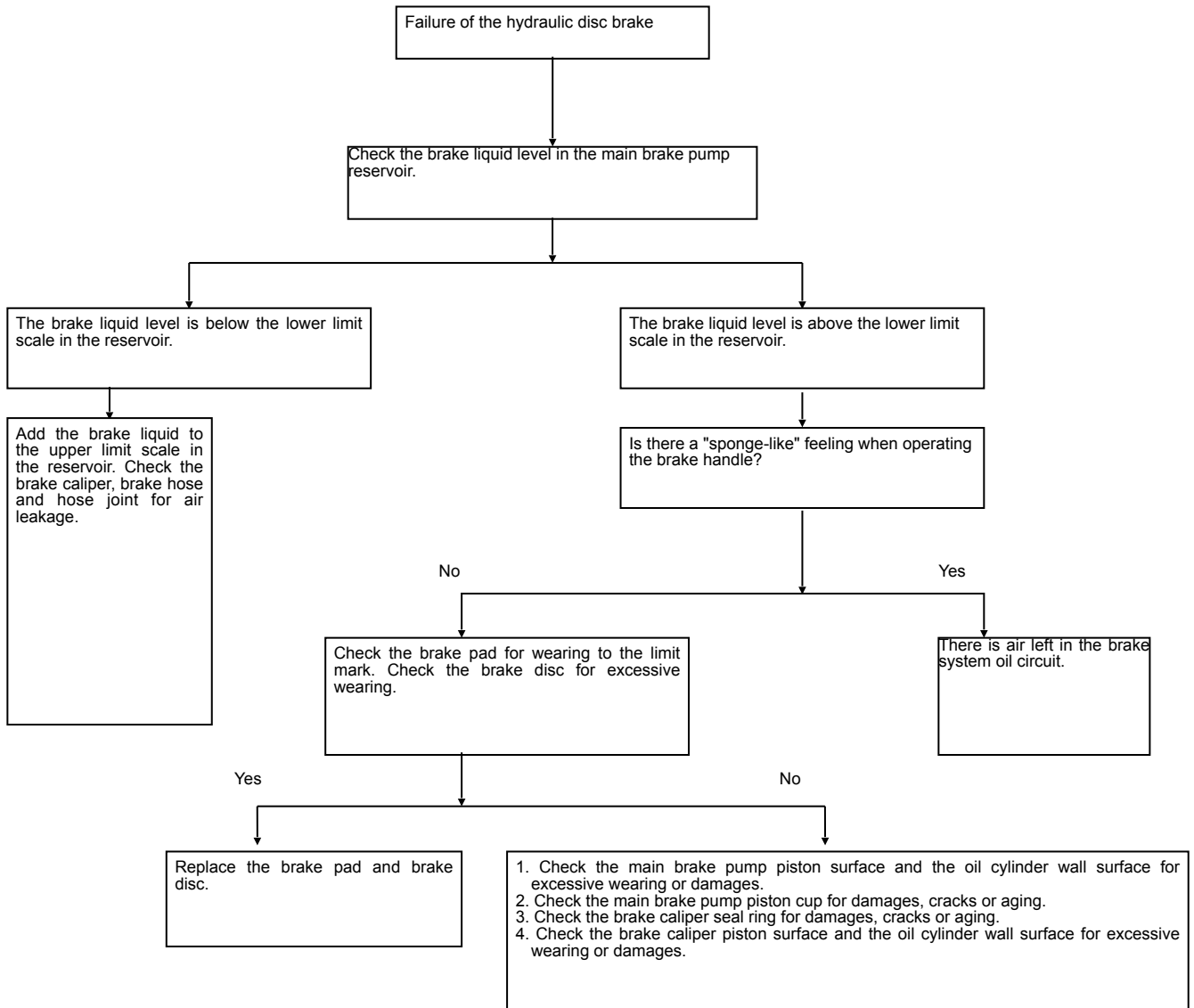
Item	Standard value (mm)	Minimum Thickness(mm)
Diameter of the front brake disc	φ220mm	-
Thickness of the front brake disc	4.0	3.0
Thickness of the front brake pad	4.0	3.0
brake fluid	DOT3 or DOT4	
Diameter of the rear brake disc	φ180mm	-
Thickness of the rear brake disc	3.5	2.5
Thickness of the rear 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/Rear wheel.



Brake System

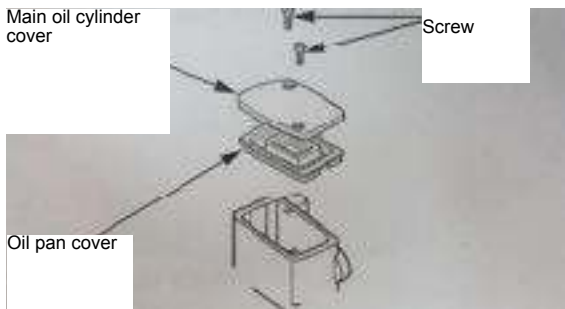
Brake liquid change/air discharging (for the disc brake type)

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.

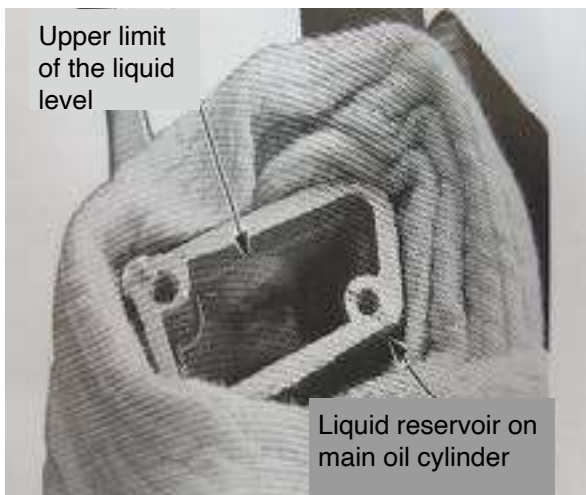
Step1: Grasp the front brake handle for several times, and then hold the front brake handle at the same time to loosen the oil drainage screw to 1/2 circle. Wait for several seconds to tighten the oil drainage screw.

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.

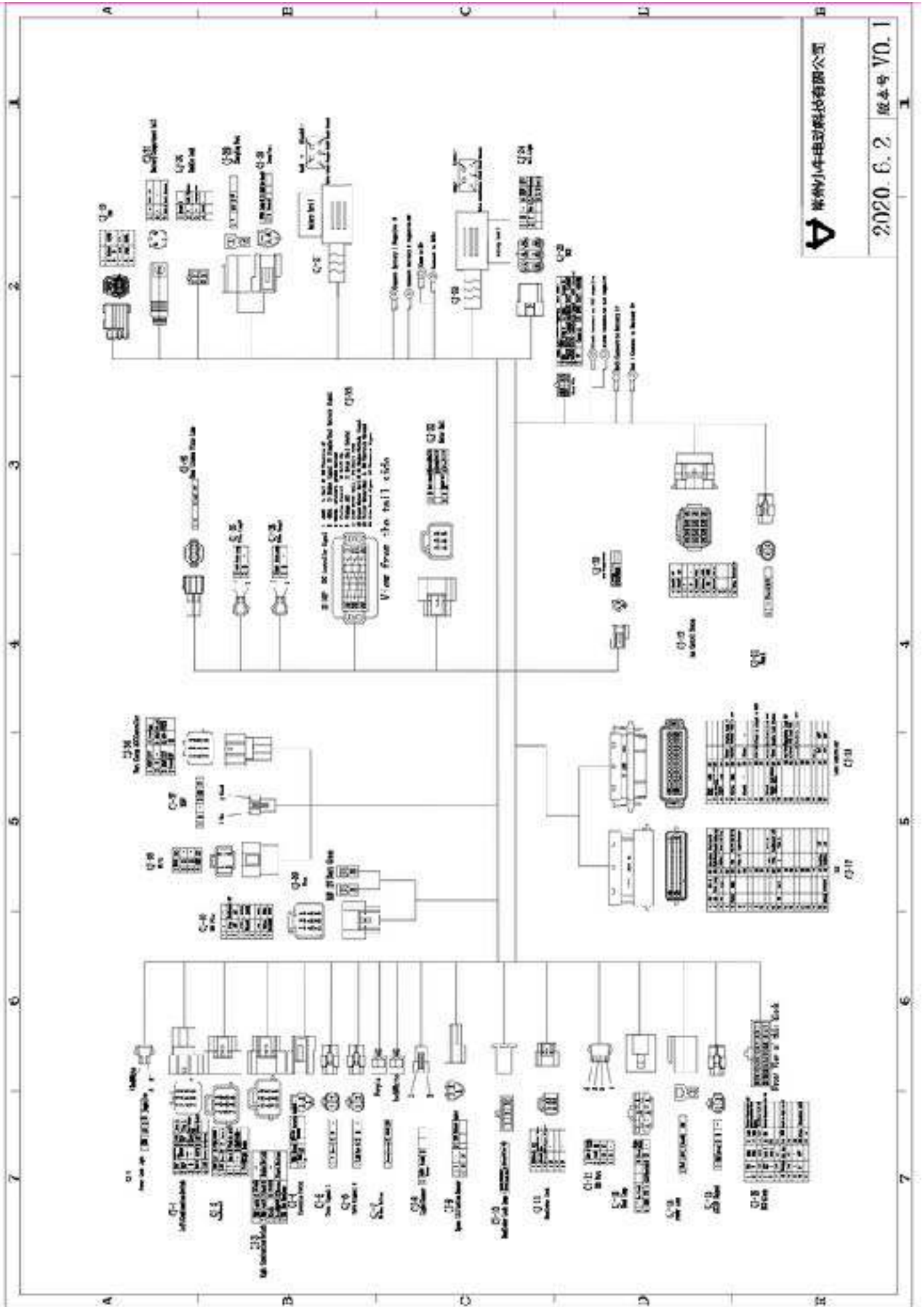
Tighten the oil drainage screw on brake caliper after the air has been discharged completely. Add the DOT3 and DOT4 brake liquid that has been sealed completely into the liquid reservoir, and add it to the upper limit of the liquid level.

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





Wiring Diagram



常州小牛电动科技有限公司
2020.6.2 版本号 V0.1



Lithium battery/charger

Overview

The charger will 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 indoors 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 more 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	2*31Ah
Charger (U-GT same)	Output voltage	48V
	Max Output current	5.2A



MGT-Battery Capacity:48V 31Ah Panasonic / 18650

Battery Pack Quantity: 2 Max Speed: 70KM/h

When battery level lower than 15%, the speed will limit to 20KM/h

5.2A, Input 100~240V Output 48V 280W







The cabling diagram of BCS



Remove the cover to check the cabling

BCS connector w Main Harness

1+: Battery1 positive pole

1-: Battery1 Negative pole

2+: Battery2 positive pole

2-: Battery2 negative pole

S-: BCS output negative pole

BCS (Battery Control System-Dual Switch Controller)

The BCS device is used to control the output and input of dual batteries and communicates with ECU.



Fast Charger--TBD

Charger Specification: Input: 100-240V AC, 12A max
Output: 35-84V DC, 12A max Operate Temperature: -10-40°C

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

The fast charger can be used onboard charging port.

Spec:

Red constantly on: Charging

Red flash: In fault status

Green constantly on: Finish charge

Green flash: Wait for connecting the batteries

Red and Green flash alternately: Updating firmware





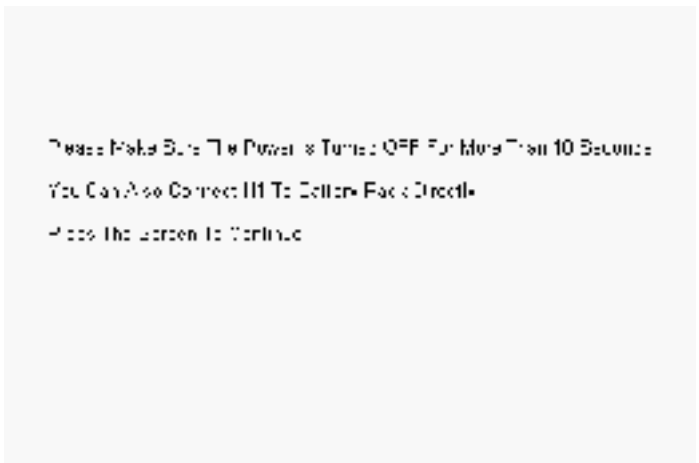
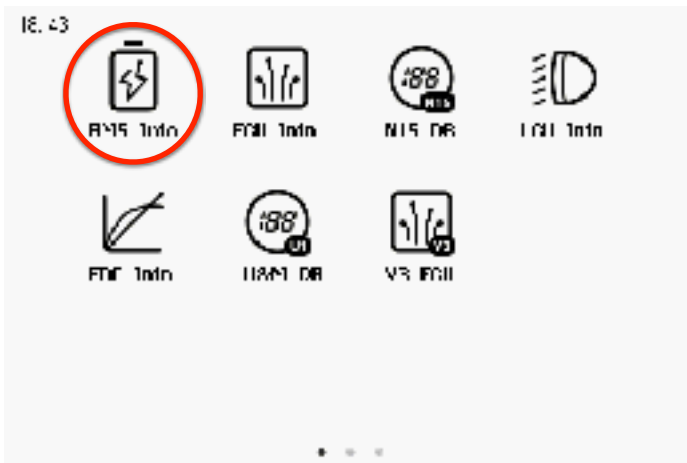
Use H1 can query BMS info to
troubleshoot for Battery pack

How to use H1, please check H1 User Manual



BMS (Battery Management System) Description

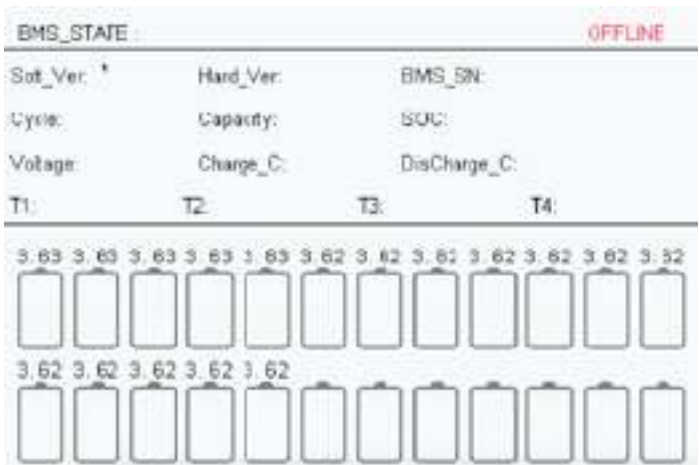
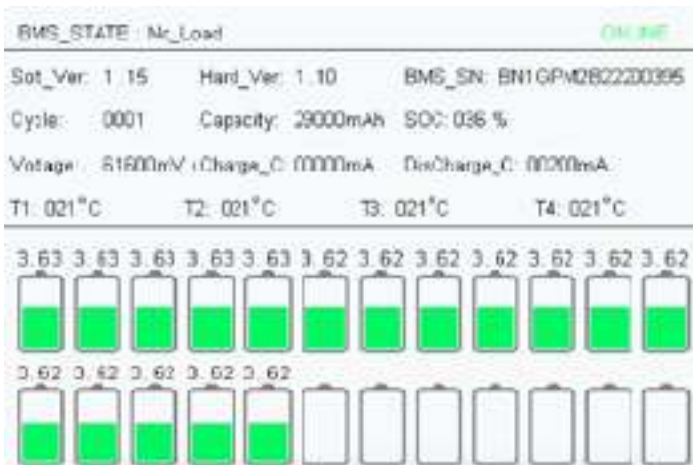
Connect H1 to Battery Pack directly, Press BMS_Info Icon to Read BMS Information



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

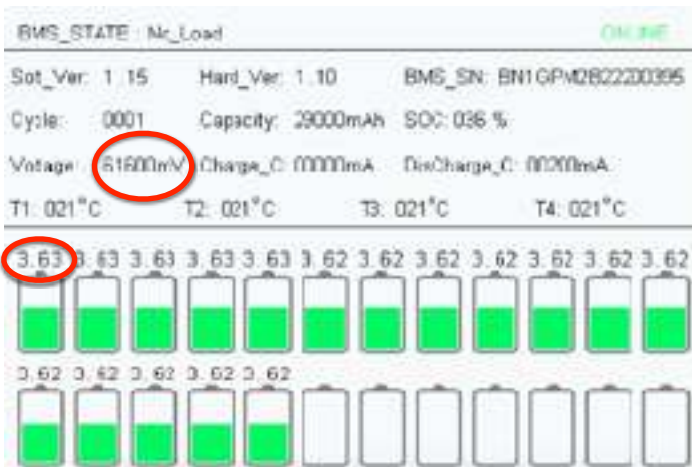
Temperature Low

Other Warning(Open Circuit detected/ Difference between Cell Voltages is higher than 0.3V.If the difference value is higher than 0.05V and lower than 0.3V, BMS would automatically start voltage balance mode)

Short Circuit

Water Detected

BMS MOS Failure



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)

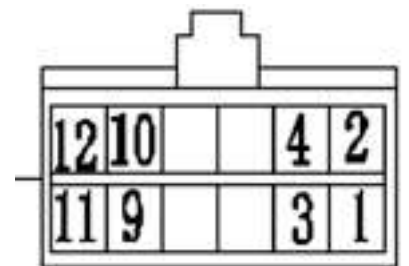


BCS



CJ-23

BCS



Rear View

1	Y&G	1 or 2 Batteries Connection Signal	8	W2	BAT1 Comm A
2	W3	BAT2 Comm A	9	P&G	Comm B
4	P&G3	BAT2 CommB	10	P&G2	BAT1 CommB
6	B&W3	BAT2 485Ground B&W			485 Ground
7	W	Comm A	12	BW2	BAT1 485地



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.

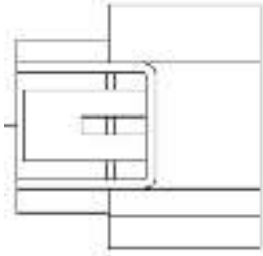
Pay attention to the wire polarity in installing the battery or controller.

Technical Specification

	Item	Specifications
Motor	Motor type	Brushless permanent-magnet motor
	Control method	FOC vector control
	Rated voltage	DC48 V
	Rated power	3000W
	Maximum motor power	3500W
Controller	Rated voltage	DC60V
	Undervoltage protection	52±1V
	Maximum input current of the controller	70A



Motor-3000W



1	B	hall ground	6	yellow	Hall A
			5	Green	Hall B
3	R	Motor Hall	4	Blue	Hall C
		5V			

CJ-32
Motor Hall



How to replace Motor (Ref: 009)

Preparation: Remove section 4 first

1. Screw up two hexagon flange bolts on the left and right side



2. Install the motor connectors on FOC controller



3. Connect the motor hall connector (Scooters produced before 2016 Dec)





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

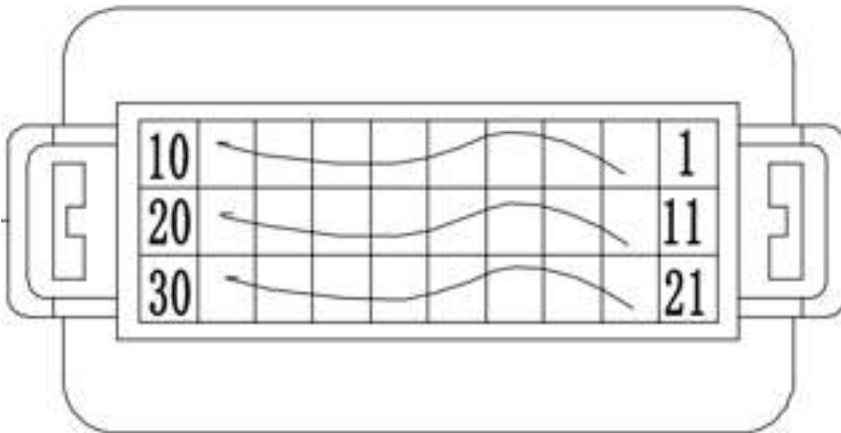
The controller stops the motor automatically to avoid unexpected injuries when the vehicle is being braked or charged.

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.



[E4]FOC controller



- 1 485B 14 Hall 5V 28 Throttle 5V
- 2 485A 15 Brake Signal 30 Single/Dual battery Signal
- 5 485地 19 Start green button
- 7 Cruise Control 20 Shift Up
- 9 Orange ACC 21 Motor Hall Gound
- 11 Blue Motor hall C 24 Shift Down
- 12 Green Motor Hall B 25 Brake Switch Signal
- 13 Yellow Motor Hall A 26 Throttle Ground
- 22 Side Stand Signal 27 Throttle Signal

CJ-33



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 replace FOC controller (Ref: 004)





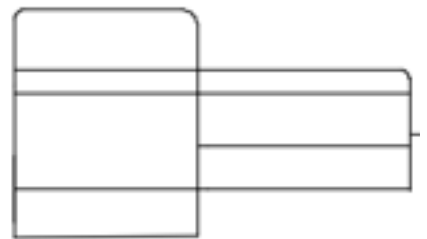
Speed regulating steering handle (Right)



CJ-9

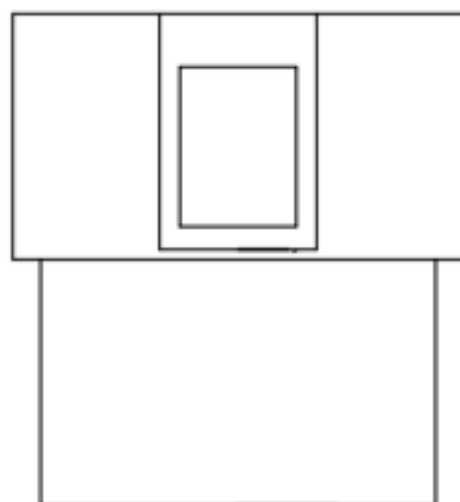
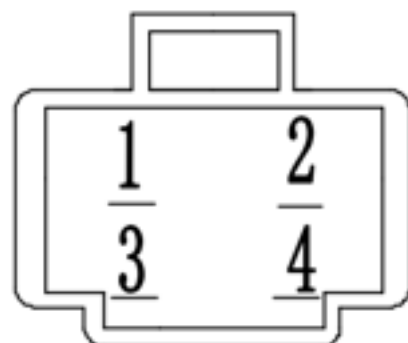
Speed Limitation Sensor

1	B	-	3	Y&W	Sensor Signal
2	R2	5V			





DC to DC



CJ-38

DC-DC

Output: 12V, 125W,
USB output: 5V2A

1	R&G	DC+
2	B	-
3	B	-
4	R&W	12V



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

Step 1: Turn the power ON.

Step 2: Check DC voltage between the Red wire and Black (Negative) at component side.

Step 3: DC voltage reading on multimeter should be same as battery voltage (~71.4V)



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

Step 1: Turn the power ON.

Step 2: Check DC voltage between the Yellow and Black (Negative) at component side.

Step 3: DC voltage reading on multimeter should be ~12V





OBD-10309001

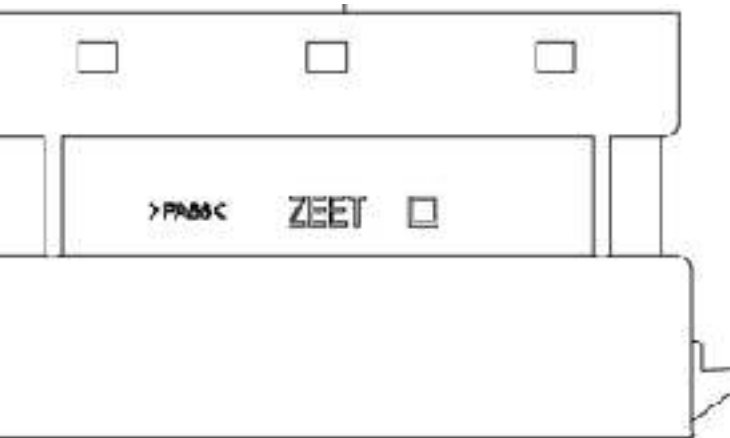


Feature To Be Discussed
Support 485 to CAN bus
communication diagnose.





LCU-10305014



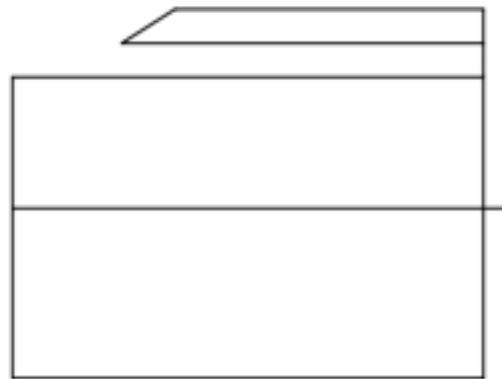
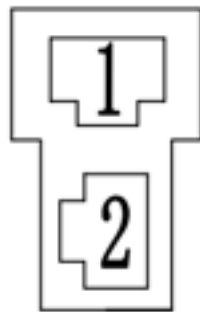
1	B&W	485 G	22	Blue White	Head Lamp On
2	R&Y	Side Lamp	23	Light Green	Harzard Warning Lamp
3	P&G	485B	24	Y&White	Auto Head Lamp
4			25		
5	White	485A	26	L&B1	Turn R(From CJ-1 6)
6			27	Pink Y	Light Sensor
7			28		
8			29		
9			30		
10			31		
11			32	L&B	Turn R
12			33	Pink	Dashboard ACC
13	Y&P	Turn L	34	Y	Turn L
14			35		
15			36		
16			37		
17			38		
18			39		
19			40		
20			41	Red&White	12V
21	W&Purple	Overraking Lamp	42	Red&White	12V

LCU

CJ-17

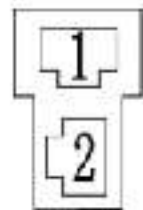


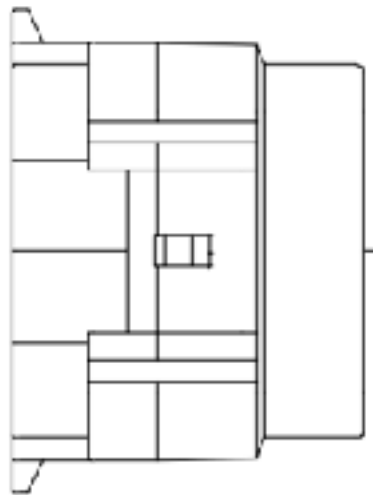
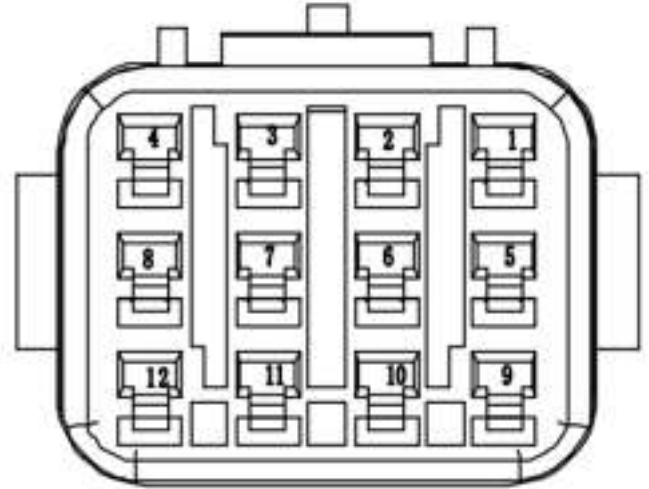
Power Lock



CJ-14 Power Lock

1	Red	48V	2	Grey	ON
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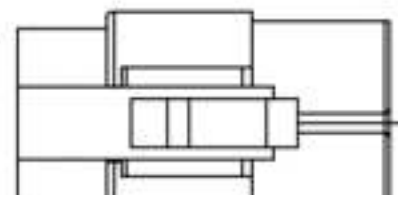
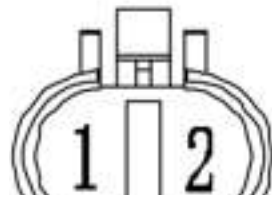
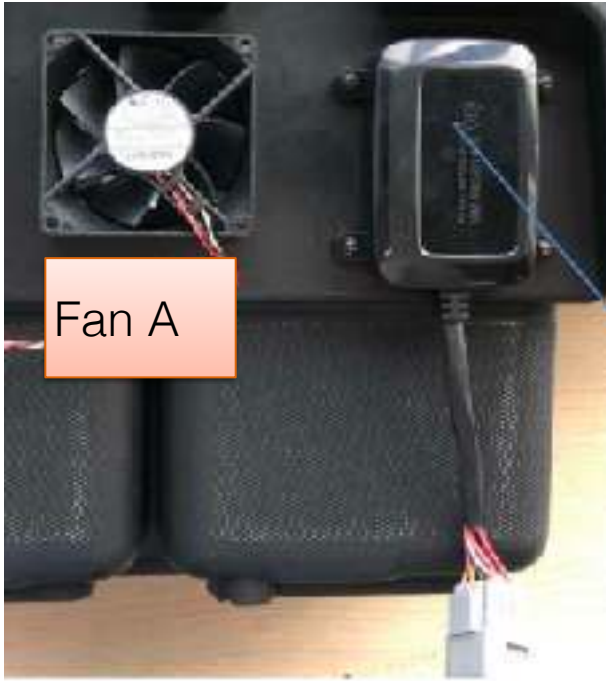


CJ-22

Fan Control System

1	Red&W	12V
2	Red&W	12V
3	B	-
4	B	-
5	White	485A
6	P&Grey	485B
7	B&W	485G
8	Yellow2	Fan A
9		
10		
11		
12	Pink	Dashboard ACC

Fan A



CJ-21
Fan A

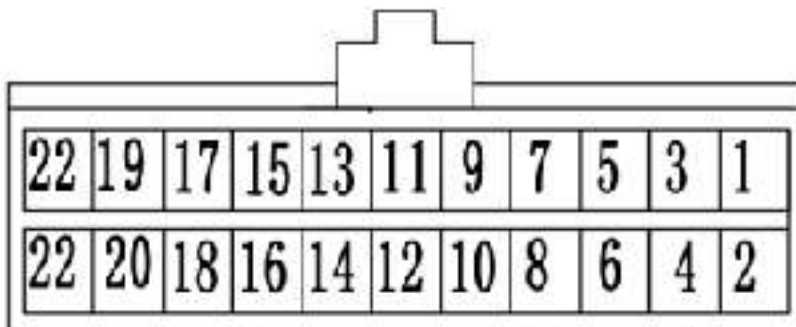
1	y2	Fan A	2	B	-
---	----	-------	---	---	---

 **MGT ECU**

Version: V35
Built-in alarm



1	P&G	485B	2	L&G	Battery Compartment H
3	W	485A	4	Y&W	Speed Limitation Hall Signal
5	B&W	485G	6	G&W	Handlebar Lock ON
7	Light Blue	Turn R	8	R3	Battery Compartment H
9	Y	Turn L	10		
11	R&W	12V	12		
13	Orange	FOC ACC	14	Y&B	Power on signal to EC
15	R&G	DC+	16		
17	B	-	18		
19	R	48V	20	Pink	Dashobard ACC
21			22	B	-



Front View of this block



The indicator definition of ECU

GPS indicator:

Green flash: GPS work normal

Green is always on: NO GPS

Green is off: GPS doesn't work

LTE indicator:

Blue flash: Communication Network normal

Blue is always on: Can not connect to the network. No Signal or Signal is weak.

Blue off: GSM module doesn't work.

Must Know:

So if ECU damaged, vehicle could still drive.

If removed ECU, the vehicle could drive with limited speed.

ECU could continue working about 48hours after the batteries drained out.

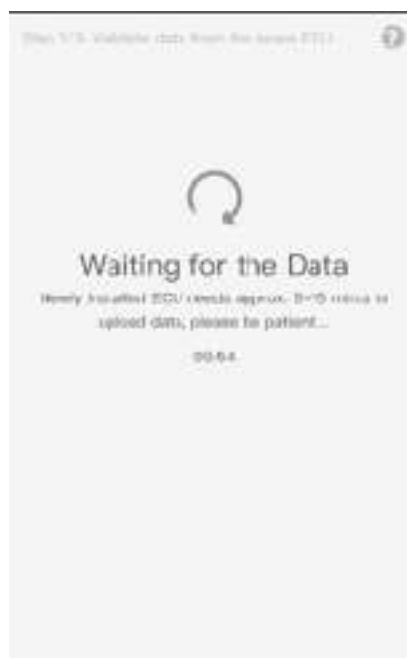


How to check ECU by checking App Data (Ref: 002)

- 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

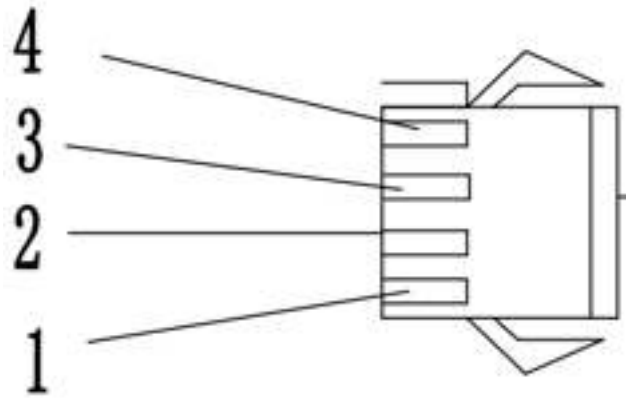
How to replace ECU (Ref: 003)

- 1 Check Section 1-3 to remove the front panel and found ECU
- 2 Replace the V35 ECU
- 3 Use a smart phone to scan the QR code of the spare part ECU
- 4 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 banned on the App
- 5 Check App status after 24 hours





USB Port

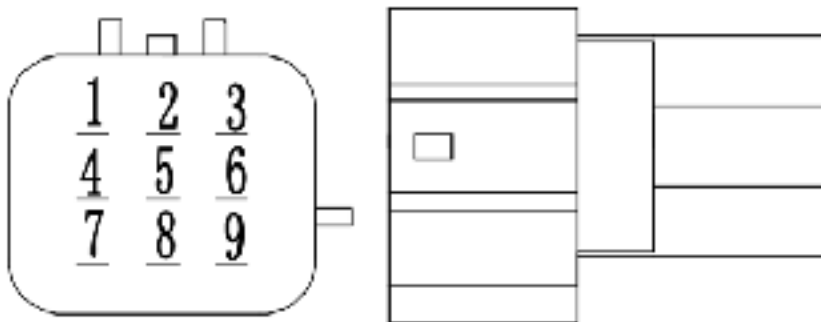


CJ-12 USB Port

1	Light R	VUSB
2	Blue3	DM
3	G3	DP
4	B	-



Left combination switch



1	B&P	Switch High Beam	6	L&B1	Turn R
2	W&P	Bypass lamp	7	Y&P	Turn L
3	B	-	8	Grey	Turn Signal Off
4	Dark G	Horn	9	G&Y	Cruise Control
5	L&G	Harzard Warning Lamp			



How to check Left Combination Switch Functions (Ref: 022)

Example: Check the Low Beam

Step 1: Turn the power ON

Step 2: Check DC voltage between PIN 6 White wire (Low Beam) and Black wire of another connector(ie Negative pin of Headlight)

Step 3: DC voltage reading on multimeter should be around 12V when the corresponding switch is on

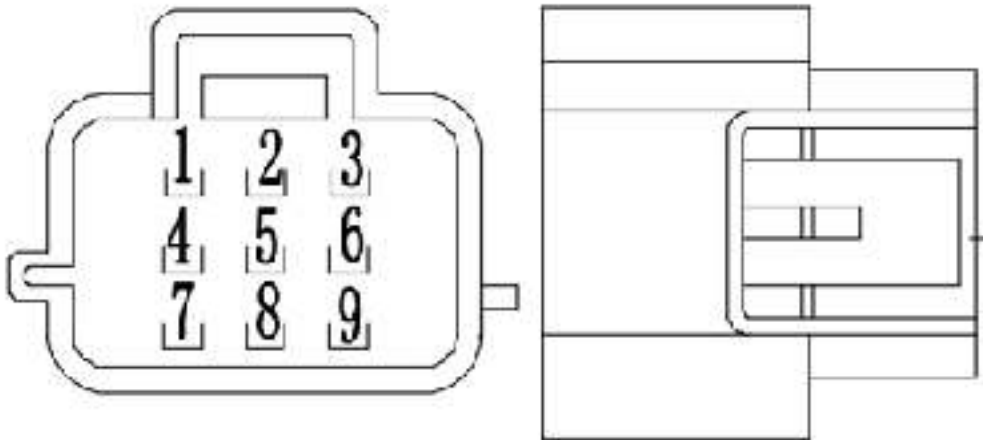
Other switch detection methods are the similar,check the corresponding wire and DC voltage should be around stable 12V.

Note: DC Voltage reading will be dynamic when checking Signal lamps due to Flasher





Right combination switch



1	W&Y -shift	6	Black	—
2	W&B +shift	7	Dark Yl	Brake Swtich
3	Black -	8	Black	—
4	Blue&W on	9	Brown	Start Button
5	Y&W		Auto Head Lamp	



How to check Right Combination Switch Functions (Ref: 021)

example:

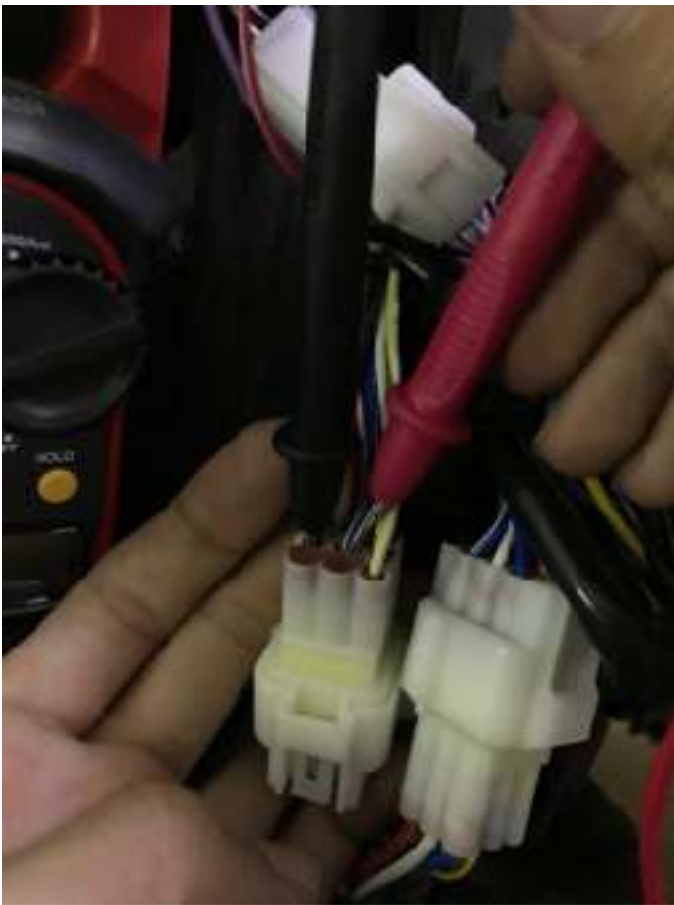
Check the Hazard Light Switch

Step 1: Turn the power ON

Step 2: Check for closed circuit between PIN 5 Blue/White wire (Hazard Lights) and Black wire

Step 3: the multimeter should beep if the circuit is closed.

Other switch detection methods are the similar.





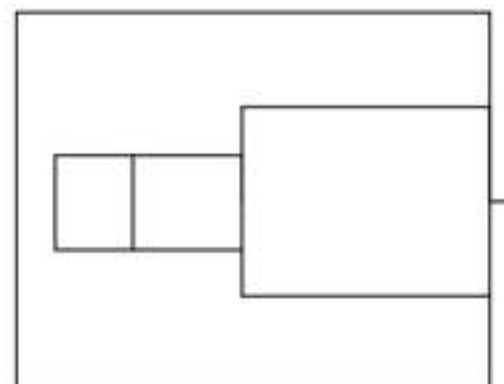
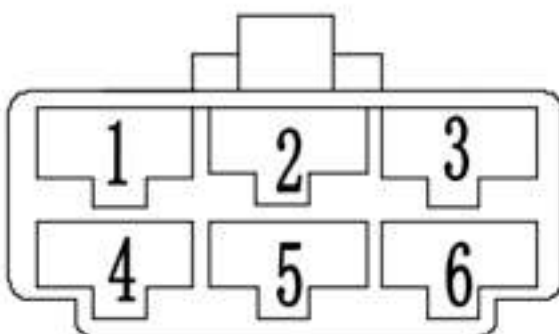
Headlight



Power:
 High Beam: 14.2W
 Low Beam: 7.6W
 Position Lamp: 3W
 Daylight: 3.4W

Head Lamp

1	W	Low Beam	2		3	Blue	High Beam
4	R&W	12V	5	G&Y	Daylight	6	B
							-





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





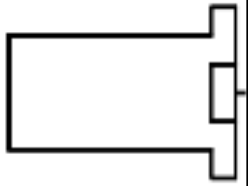
Step 3: DC voltage reading on multimeter should be ~12V


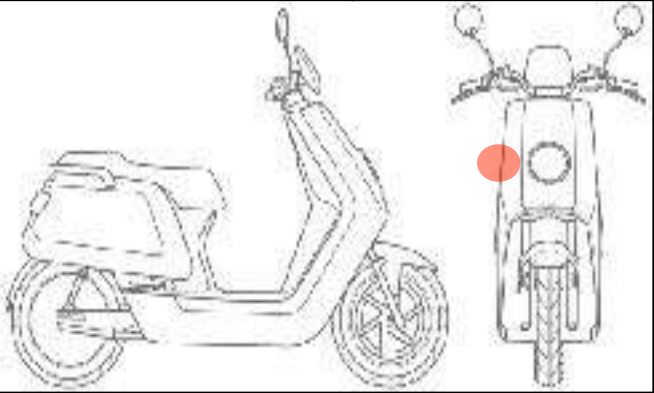

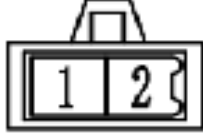
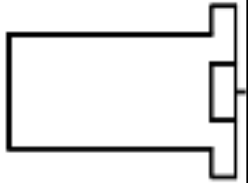
If 12V exist but Headlight does not illuminate, replace Headlight

If 12V does not exist, harness is broken



Turn Signal Lamps

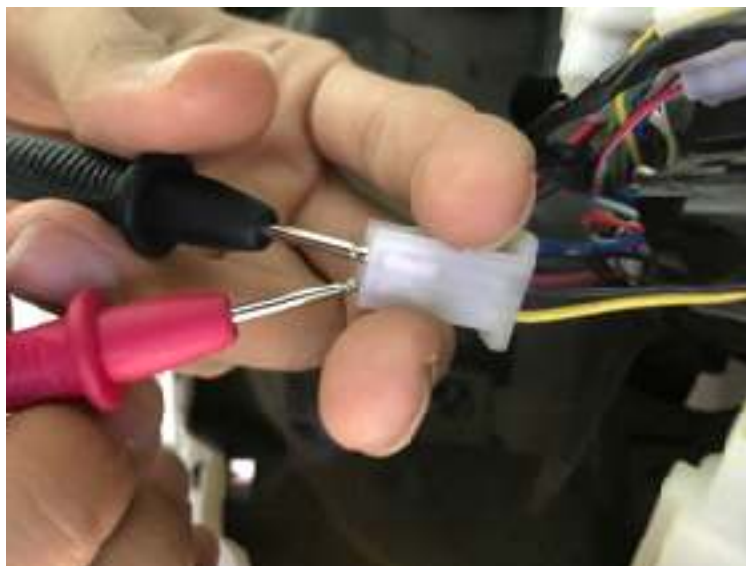
Component Name	Left/Right turn signal lamp	Connector Code	J7-A
			
Disassembling order: Section 2>3			
Connector Definition			
PIN	Color	Definition	
1	Yellow	Left turn signal lamp	
2	Black	Negative electrode	
			

Component Name	Right turn signal lamp	Connector Code	J8-A
			
Disassembling order: Section 2>3			
Connector Definition			
PIN	Color	Definition	
1	Light blue	Right turn signal lamp	
2	Black	Negative electrode	
			



How to check Left turn signal lamp (Ref: 024)

- Step 1: Make the Flasher connector PIN2(Grey) and PIN3(Red/White) shorted with a short wire.
- Step 2: Disconnect the Left turn signal lamp connector
- Step 3: Turn the power ON and then turn the left turn switch ON
- Step 4: Check DC voltage between Yellow wire and Black wire on harness side
- Step 5: DC voltage reading on multimeter should be ~12V



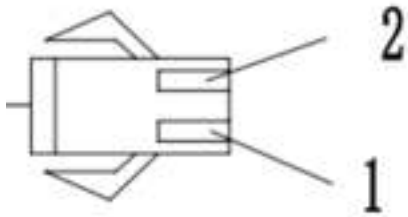
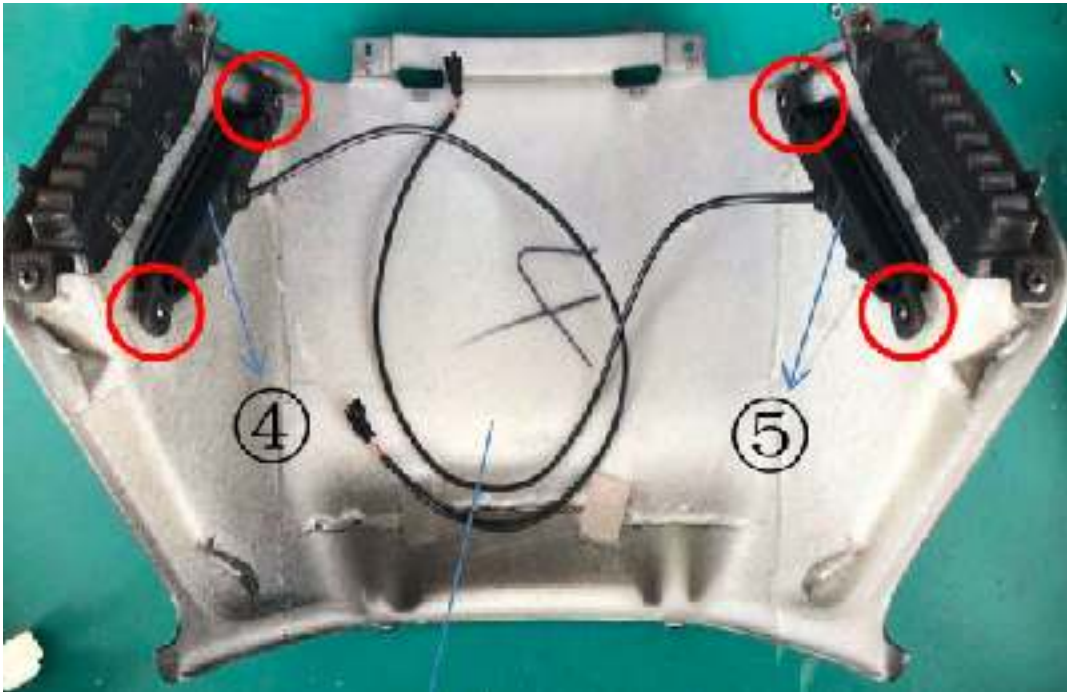
How to check Right turn signal lamp (Ref: 025)

- Step 1: Make the Flasher connector PIN2(Grey) and PIN3(Red/White) shorted with a short wire.
- Step 2: Disconnect the Right turn signal lamp connector
- Step 3: Turn the power ON and then turn the left turn switch ON
- Step 4: Check DC voltage between Blue wire and Black wire on harness side
- Step 5: DC voltage reading on multimeter should be ~12V



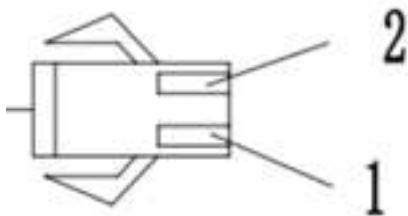


Side Lamp 12V LED



1	R&Y	Side Lamp
2	B	-

CJ-35
Side Lamp2

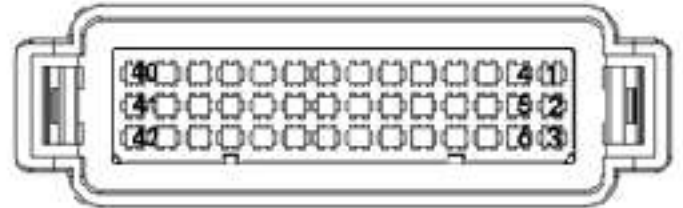
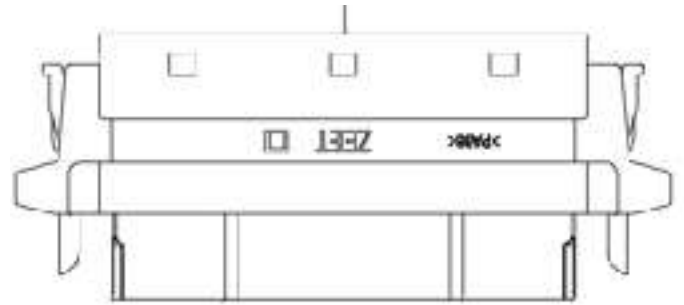
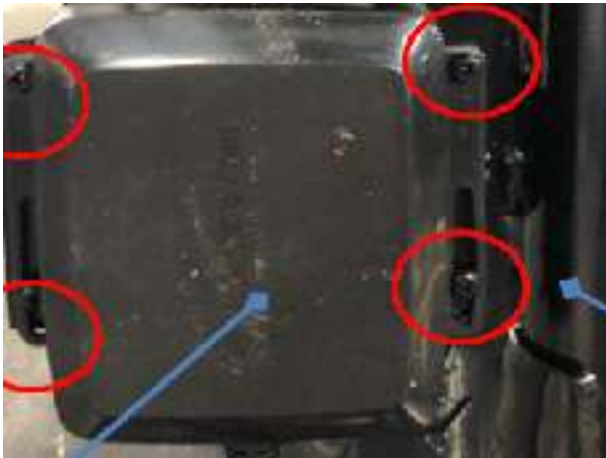


1	R&Y	Side Lamp
2	B	-

CJ-34
Side Lamp1



Lock Controller



1	Black White	485G	22		
2	Grey Green	Handlebar Lock Lump	23		
3	Purple Grey	485B	24		
4			25	Brown2	Saddle Lock ID
5	White	485A	26	Yellow2	Saddle Lock on 12V
6			27		
7	Black	-	28	Black	-
8			29		
9			30	Yellow Black	Power on signal to ECU
10			31		
11	Black	-	32	Red Green	Handlebar Lock VCC
12	Purple White	Lock Trigger Signal	33	Green1	Saddle Lock Status
13			34		
14			35	Grey White	Handlebar Lock ON
15			36	Red Green1	PWM Lock VCC
16			37	Brown G2	Handlebar Lock OFF
17			38		
18			39		
19			40	Black	-
20			41	Red	48V
21			42	Red	48V



Saddle Lock



1	Brown2	ID
2	G1	Lock Status
3	Y2	Unlock 12V
4	Black	-

CJ-30

Saddle Lock



TBD

CJ-10

Handlebar Lock Lamp

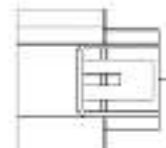
1	Red/Green	Handlebar	1	Red/Green	PN Lock	PC
	Green	Lock Lamp				



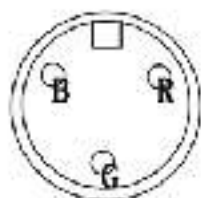
CJ-11

Handlebar Lock

1	Red/Green	POC
2	Brown	Handlebar Lock
	Grey/2	Lock
3	Purple/4	Trigger Signal
4	B	-
5	B	-
6	B	-



Battery Compartment Hall




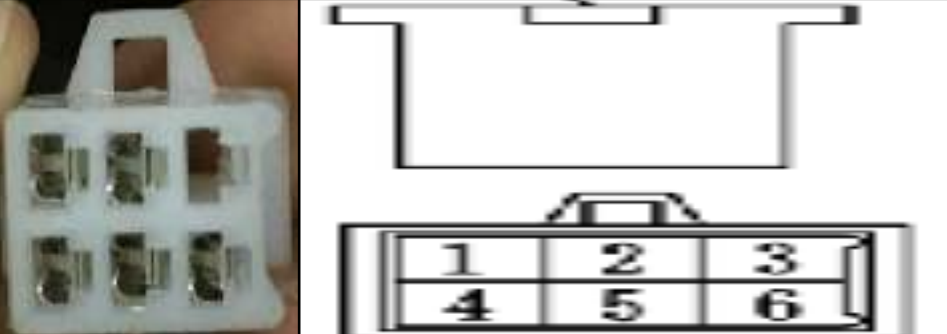


1	R3	Hall VCC
2	B	-
3	Light G	Hall Signal

CJ-31
Battery Compartment Hall



Tail Light

Component Name	Tail Light	Connector Code	J9-A
			
Disassembling order: Section 2>3			
Connector Definition			
PIN	Color	Definition	
1	Black	Negative electrode	
2	Yellow	Left lamp signal wire	
3	/		
4	Red and white	Power cord (12V)	
5	Violet	Brake lamp	
6	Light blue	Right lamp signal wire	
			



How to check Tail Light power input (Ref: 026)

Step 1: Turn the power ON

Step 2: Check DC voltage between Red/White wire and Black wire on harness side

Step 3: DC voltage reading on multimeter should be around~12V




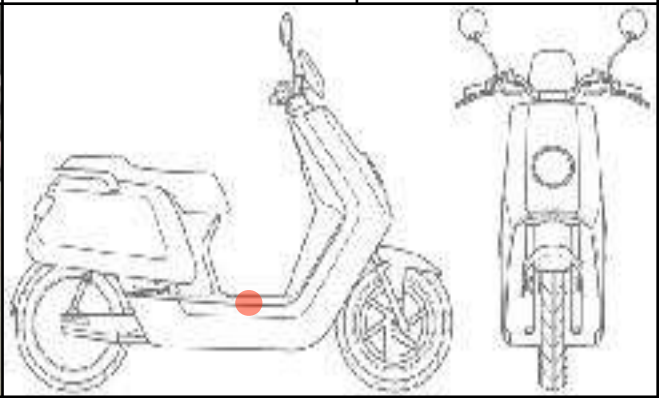


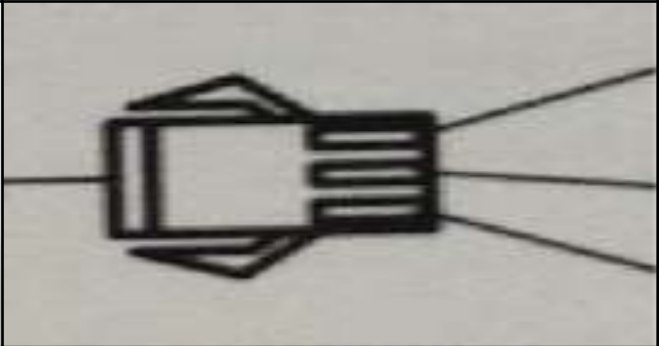


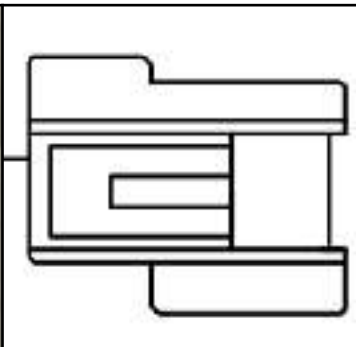
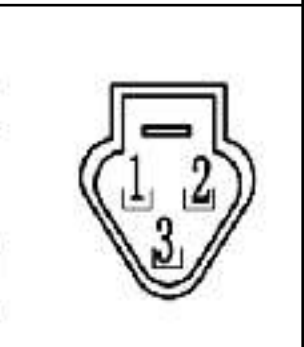
Step 4: Press the brake, DC voltage reading on multimeter should also be around~12V

If 12V exist and Tail light does not illuminate, then replace the taillight





Side Stand

Component Name	Side Stand Switch	Connector Code	
			
Disassembling order: Section 4>5>6>7			
Connector Definition			
PIN	Color	Definition	
1	Red	Power cord (5V)	
2	Yellow	Side Stand Switch signal	
3	Black	Negative electrode	
Manufactured From 05-2016 to 12-2016			
			
Manufactured From 01-2017 ~current			
			



Prop Stand: If the prop stand is extended, the electronic motor is cut-off. It cannot be restarted until the prop stand is moved into its retracted position.

How to check Side Stand Switc (Ref: 027)

Step 1: Disconnect the connector to Check power input;

Check DC voltage between Red wire and Black wire on harness side, Voltage reading should be ~5V

Step 2: Turn the power ON

Step 3: Connect the connector to Check DC voltage between Yellow wire and Black wire on component side



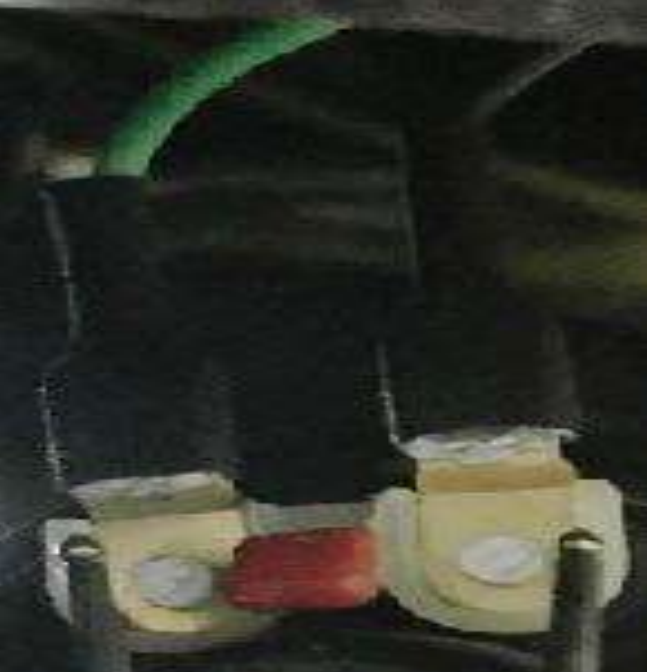


Step 4: When the side stand is retrieved(not used), voltage should be around ~3.5V

When the side stand is used(side stand is down), voltage should be 0V.



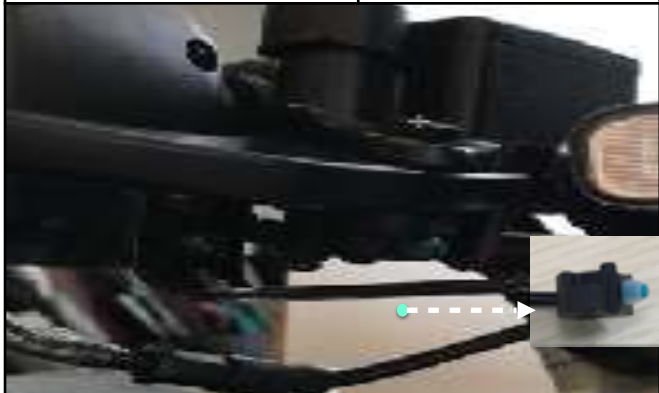
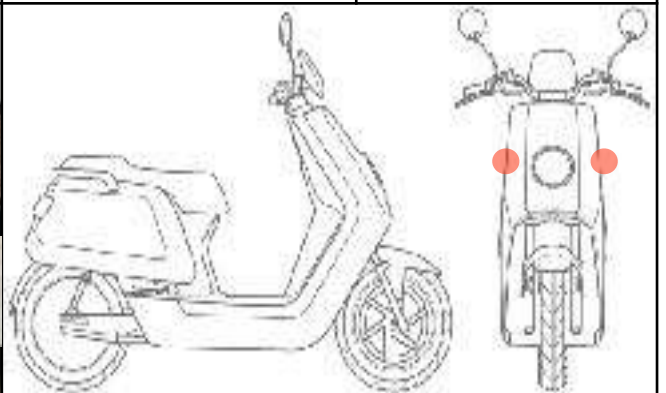

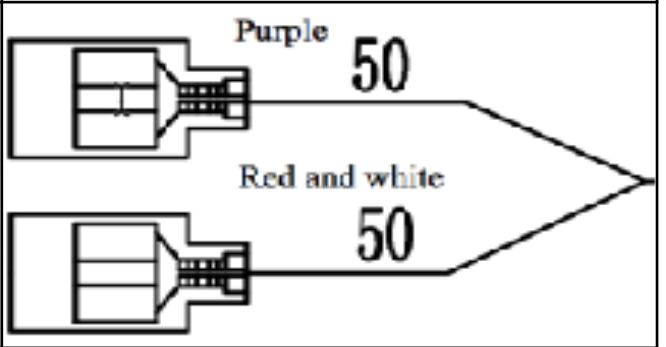


Horn

Component Name	Horn	Connector Code	
			
Disassembling order: Section 2>3			
Connector Definition			
PIN	Color	Definition	
1	Green	Horn	
2	Black	Negative electrode	
		 <p data-bbox="1214 981 1331 1048">Black</p>  <p data-bbox="1214 1352 1437 1420">Dark green</p>	



Brake Switch

Component Name	Left/right brake Switch	Connector Code	J16-B
			
Disassembling order: Section 2>3			
Connector Definition			
PIN	Color	Definition	
1	Red	Power cord(12V)	
2	Violet(harness side)	Left/right brake handle signal wire	
			



How to check Brake Switch (Ref: 028)

Step 1: Disconnect the Red and Black wires of the Brake Switch connector





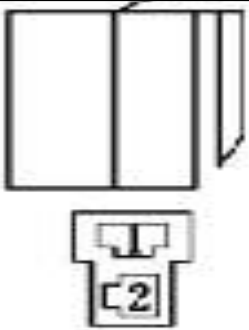
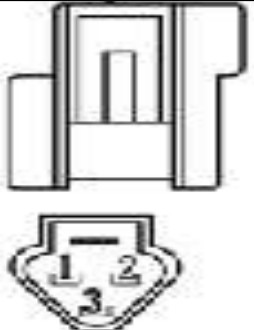


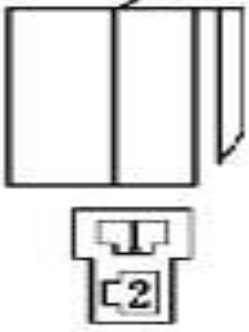
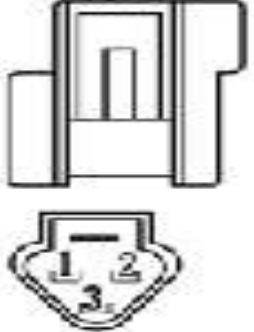


Step 2: Connect Multimeter Positive and Negative pins to the connectors and Set multimeter to test closed circuit mode, then pull the brake, the multimeter should beep if the Brake Switch is working.





Charging Port

Component Name	Charging Port	Connector Code	J10-A
			
Disassembling order: Section 4			
Connector Definition			
PIN	Color	Definition	
1	Red	Power cord (60V)	
2	Black	Negative electrode	
1	Purple and Grey	Communication B	
2	White and Grey	Communication A	
3	Black and White	485 Earth	
			
			



Dashboard



High version- Colour TFT LCD dashboard

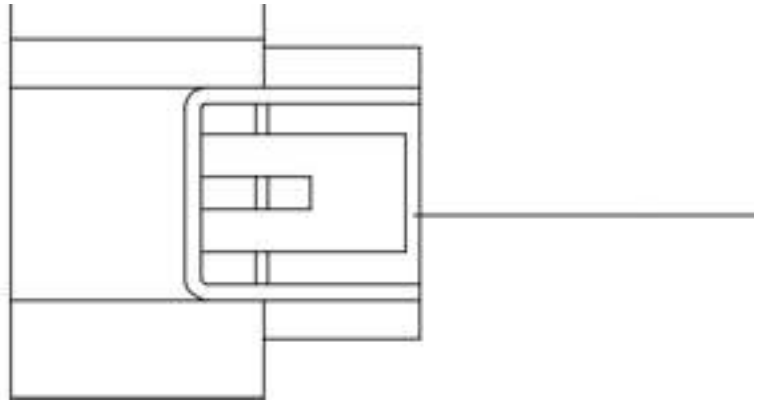
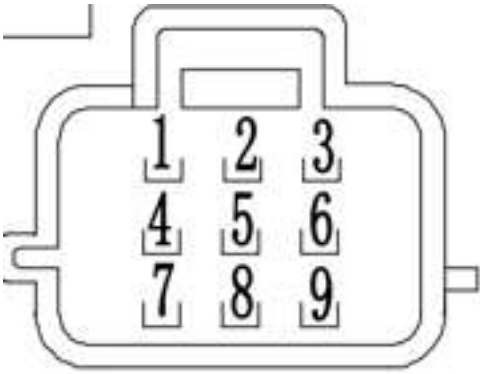


Lower version-Black-white dashboard



Dashboard

MGT uses a colorful LED large screen. The backlight will adjust according to the illumination intensity. When the illumination intensity is high, the backlight will be white. When it is low, the backlight will be changed according to the illumination.



CJ-2 Dashboard

1	R&W	12V	6	P&G	Comm B
2	L&B	Turn R	7	Y	Turn L
3	W	Comm A	8	Pink	DB ACC
4	B	—	9	B&W	485—
5	Blue	High Beam			



Dashboard Status in normal



When the two batteries voltage difference is less than 0.8V, it would show the S icon.

And the left icon battery we named the first battery is the one in battery compartment and the right icon battery we named the second battery is the one in helmet bucket.

Battery 2-
in helmet bucket



Battery 1-in
Compartment



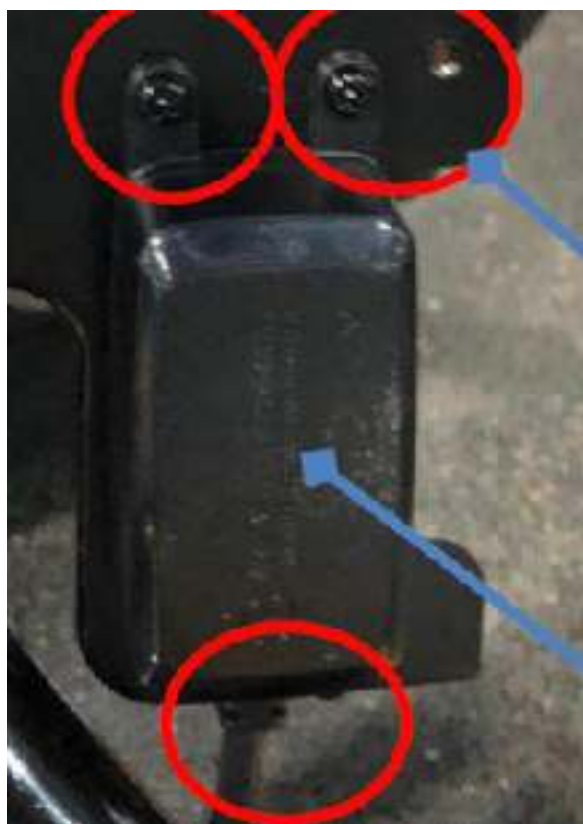
3 Distinct Driving Modes

SPORT Maximum speed and performance

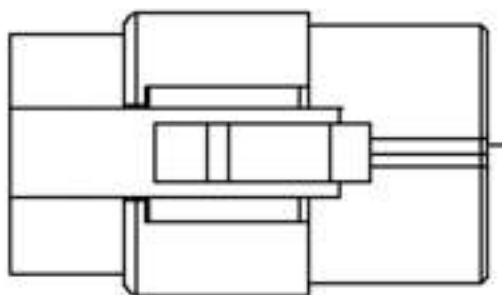
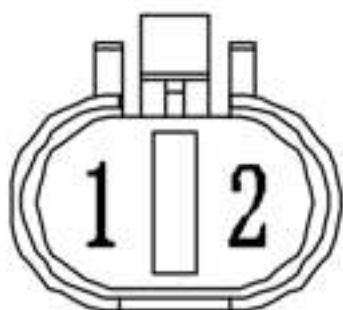
DYNAMIC Perfect for everyday use

E-SAVE Longer range, greater efficiency

 ACC(Fast Charger)



Support protocol: QC2.0/3.0,
Max current 3A
Output:12V,3A



CJ-15
ACC12V Output

1	R&Y	12V-ACC	2	B	-
---	-----	---------	---	---	---



Diagnostic Code List

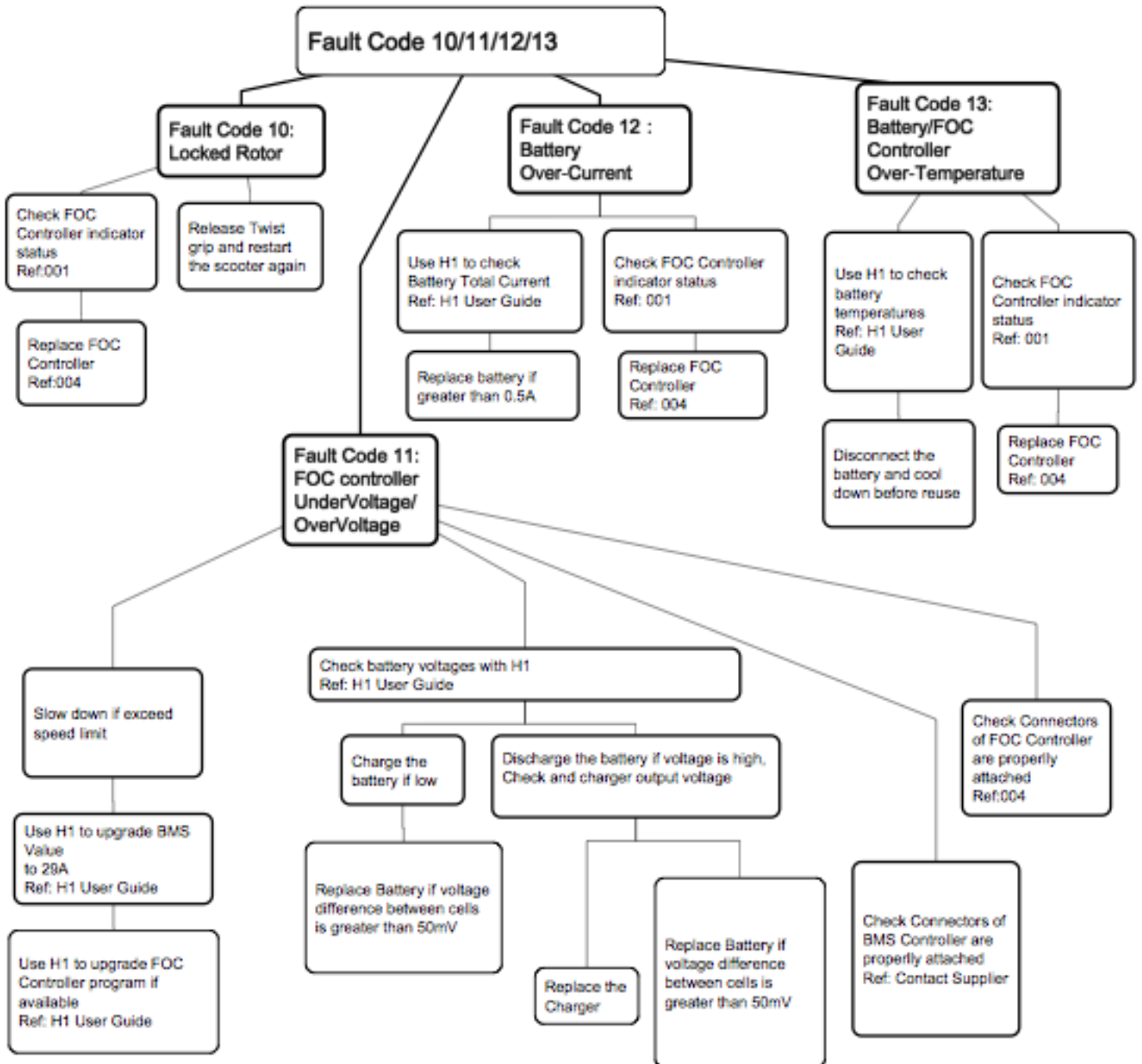
1	121	BCS MOSFET damaged
2	138	Battery 1 MOS transistor damaged
3	136	Battery 1 drop in water
4	135	Battery 1 short-circuit protection warning
5	134	Battery 1 open circuit or imbalance warning
6	158	Battery 2 MOS transistor damaged
7	156	Battery 2 drop in water
8	155	Battery 2 short-circuit protection warning
9	154	Battery 2 open circuit or imbalance warning
10	130	Battery 1 over-discharge protection warning
11	150	Battery 2 over-discharge protection warning
12	132	Battery 1 over-heat protection warning
13	152	Battery 2 over-heat protection warning
14	133	Battery 1 low-temp protection warning
15	153	Battery 2 low-temp protection warning
16	131	Battery 1 discharge over-current protection warning
17	151	Battery 2 discharge over-current protection warning
18	122	BCS discharge over current protection warning
19	110	Controller power fault
20	120	Motor fault
21	140	Throttle twist fault
22	183	Fast charging power short-circuit protection
23	161	Remote lock
24	111	FOC controller verification failed
25	191	Battery 1 communication fault



26	192	Battery 2 communication fault
27	190	FOC controller Communication fault
28	193	Lock controller communication fault
29	194	BCS communication fault
30	10	FOC controller Locked rotor
31	11	FOC controller undervoltage or overvoltage
32	12	FOC controller over-current
33	13	FOC controller over-heat
34	22	BCS over-heat
35	23	BCS low-temp
36	31	Battery 1 charging over-current protection warning
37	51	Battery 2 charging over-current protection warning
38	30	Battery 1 over-charge protection warning
39	50	Battery 2 over-charge protection warning
40	80	Fast charger power temp protection
41	81	Fast charger power over-voltage protection
42	82	Fast charger power over-current protection
43	60	Communication module failure. Sim cannot recognize
44	65	ECU no SN for recognition
45	67	ECU no network or lack credit
46	99	Main harness issue

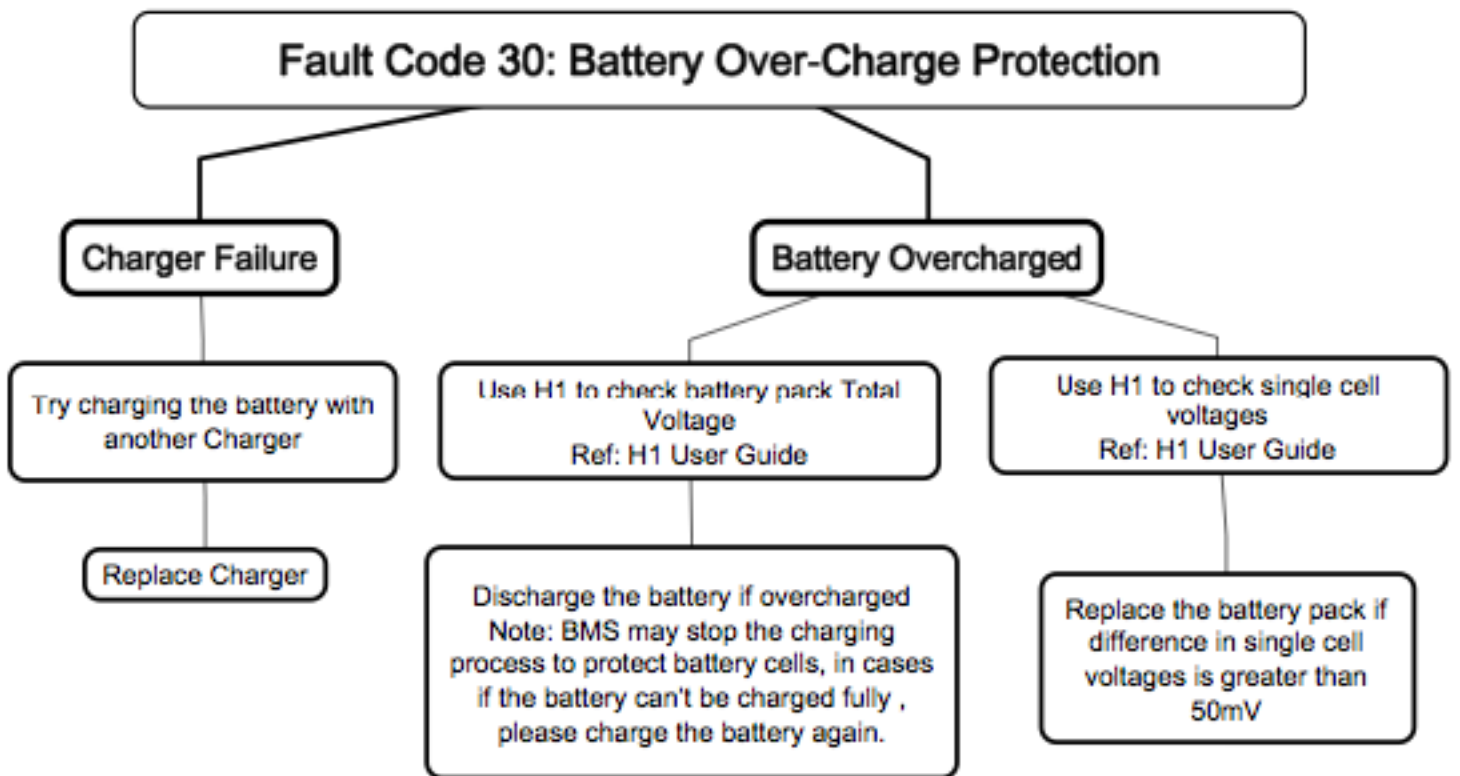


Diagnostic Code - 10/11/12/13 on display





Diagnostic Code - 30 on display





Diagnostic Code - 31 on display



Fault Code 31 Charging Over-Current Protection

Charger Failure

Try charging the battery with another
Charger

Replace Charger

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



Diagnostic Code - 32 on display



Fault Code 32 Charging Prohibited at Low Temperature

Battery temperature sensors failure

Use H1 to check Temperature sensors
Ref: H1 User Guide

Replace the BMS if temperature is imbalanced
Ref: Contact Supplier

Battery Temperature LOW (below-20°)

Take the battery pack indoor until back to normal operating temperature



Diagnostic Code - 60/62/63/64/65 on display



Fault Code 60/62/63/64/65

**Fault Code 60:
SIM Card
Identification
Failure**

**Fault Code 62:
GPS Module
Failure**

**Fault Code 63:
GPS Antenna
Short Circuit**

**Fault Code 64:
GPS Antenna
Open Circuit**

**Fault Code 65:
ECU SN
Missing/Incorrect**

Disconnect the battery
pack and connect again
after 10 seconds

Disconnect the battery
pack and connect again
after 10 seconds

Update ECU Program

Update ECU Program

Replace ECU
Ref: 003

Replace ECU
Ref: 003

Replace ECU
Ref: 003

Disconnect the battery
pack and connect again
after 10 seconds

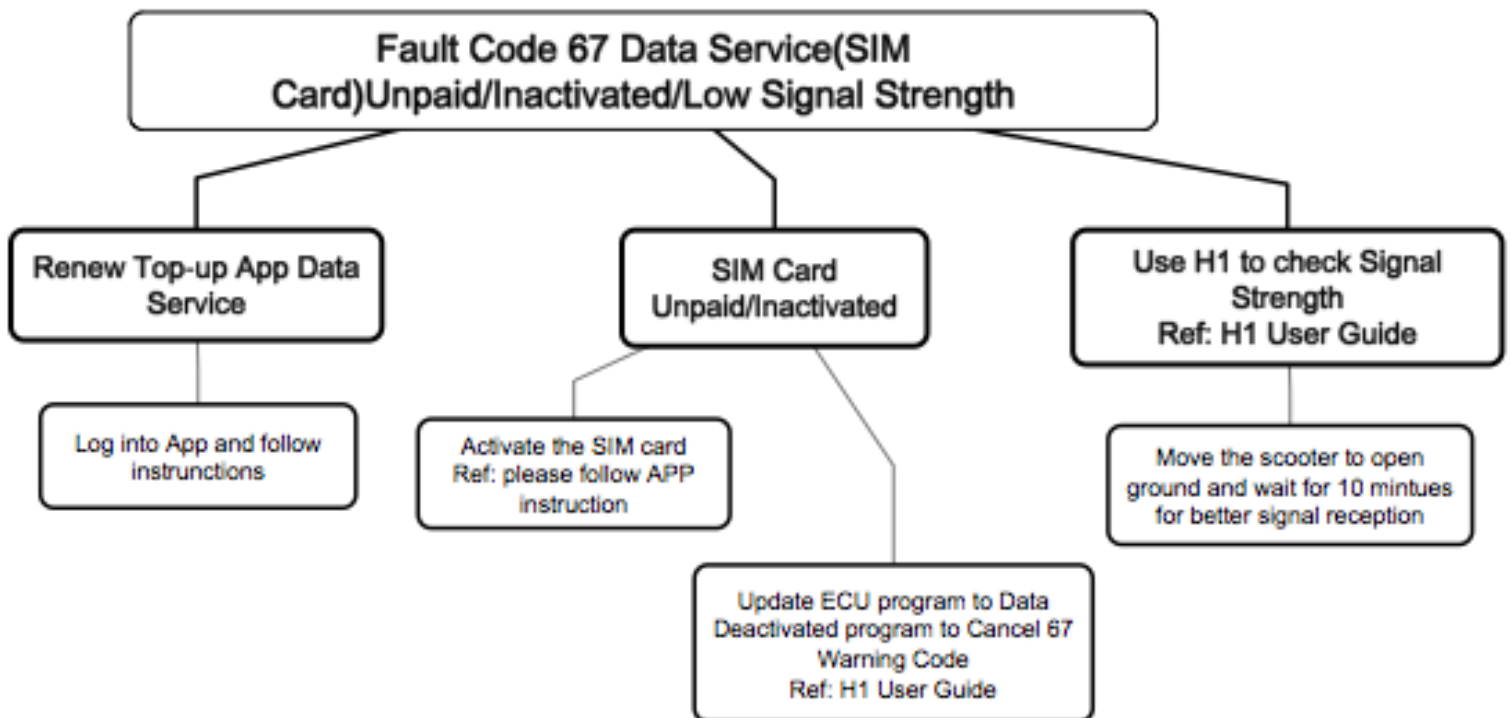
Disconnect the battery
pack and connect again
after 10 seconds

Replace ECU
Ref: 003

Replace ECU
Ref: 003

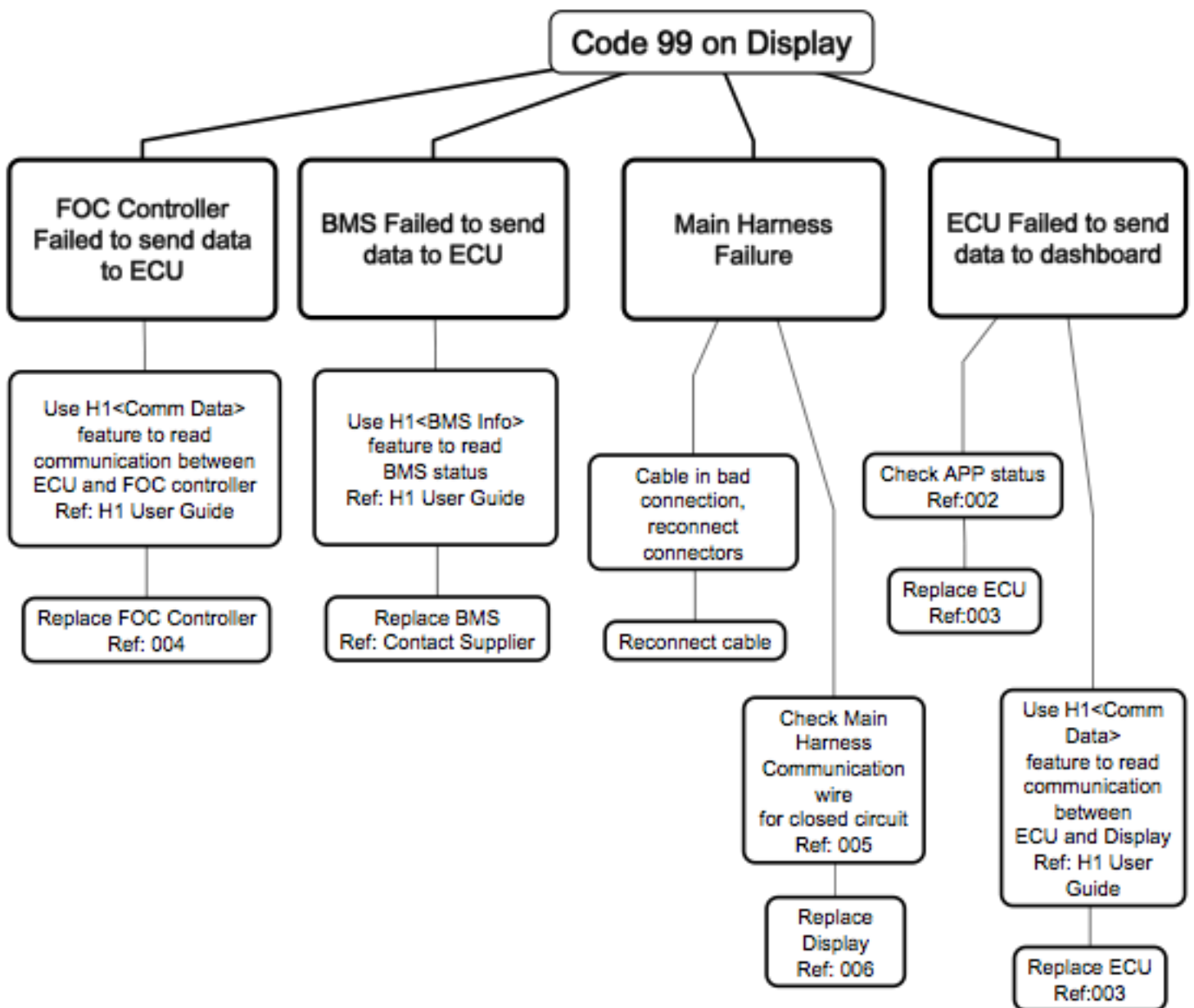


Diagnostic Code - 67 on display



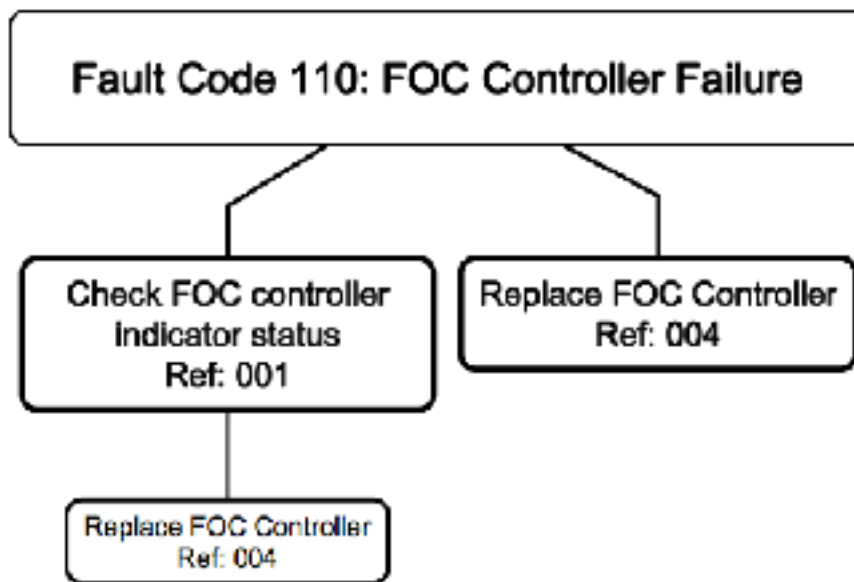


Diagnostic Code - 99 on display





Diagnostic Code - 110 on display

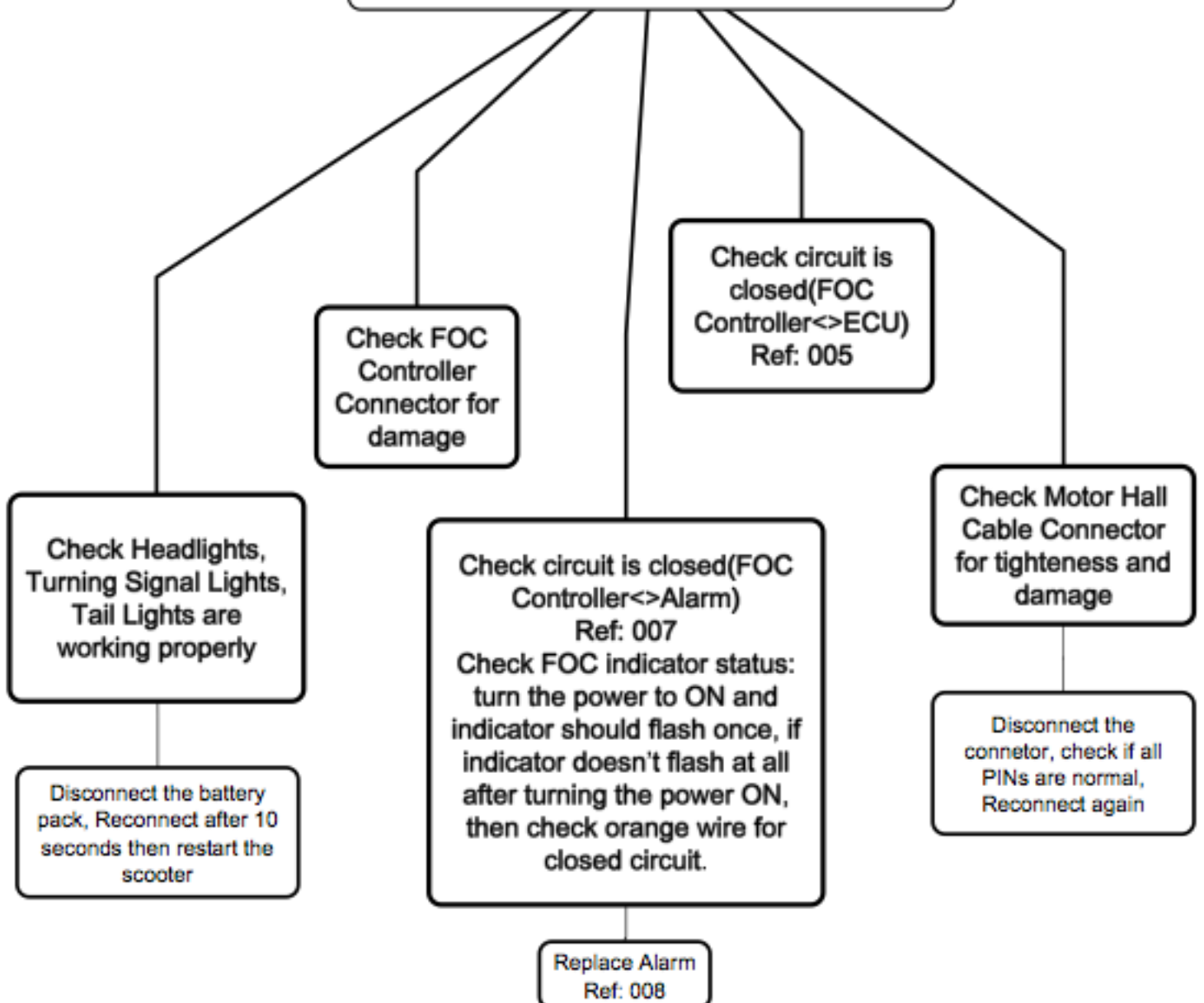




Diagnostic Code - 111 on display

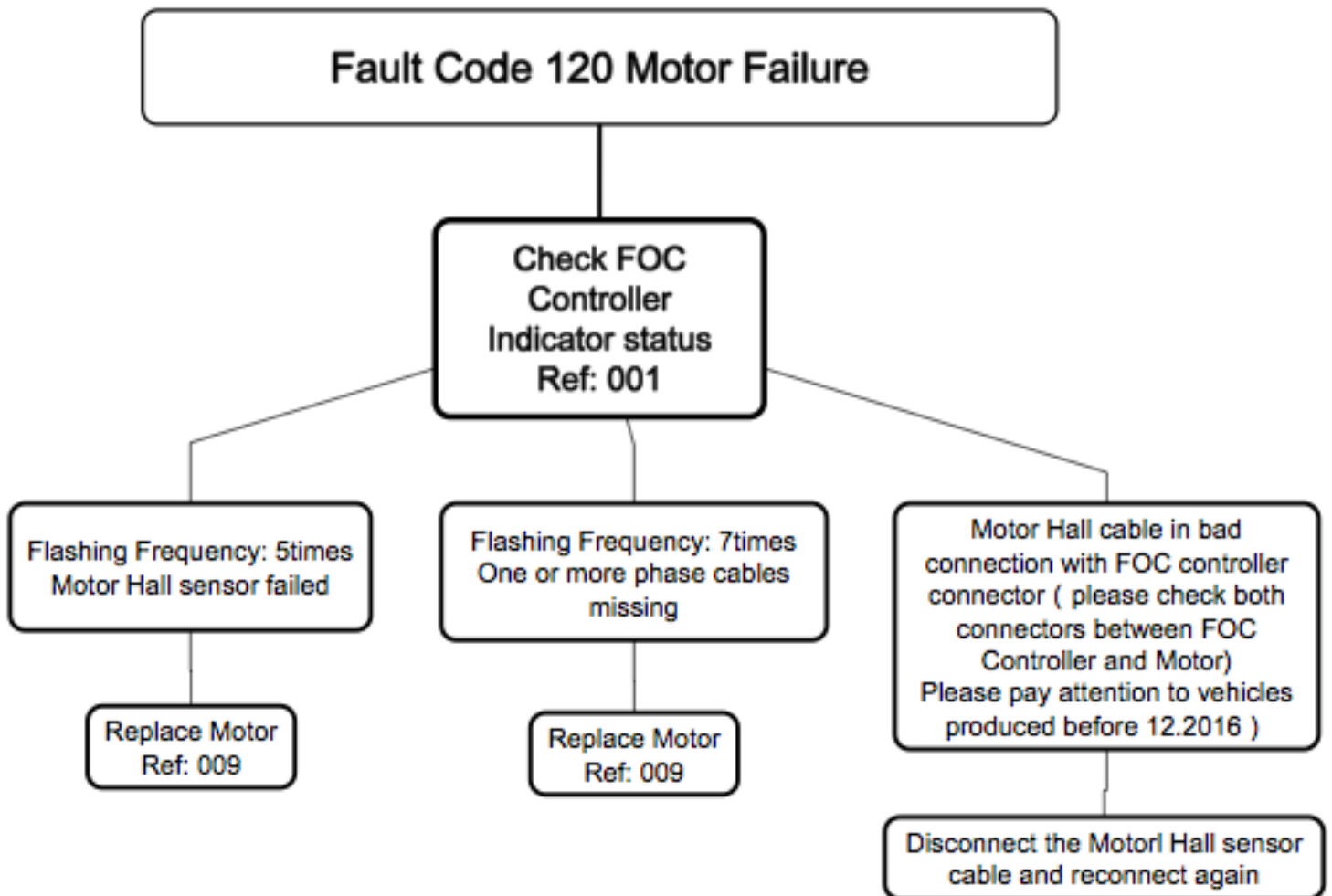


Fault Code 111 FOC : Controller Verification Failure





Diagnostic Code - 120 on display

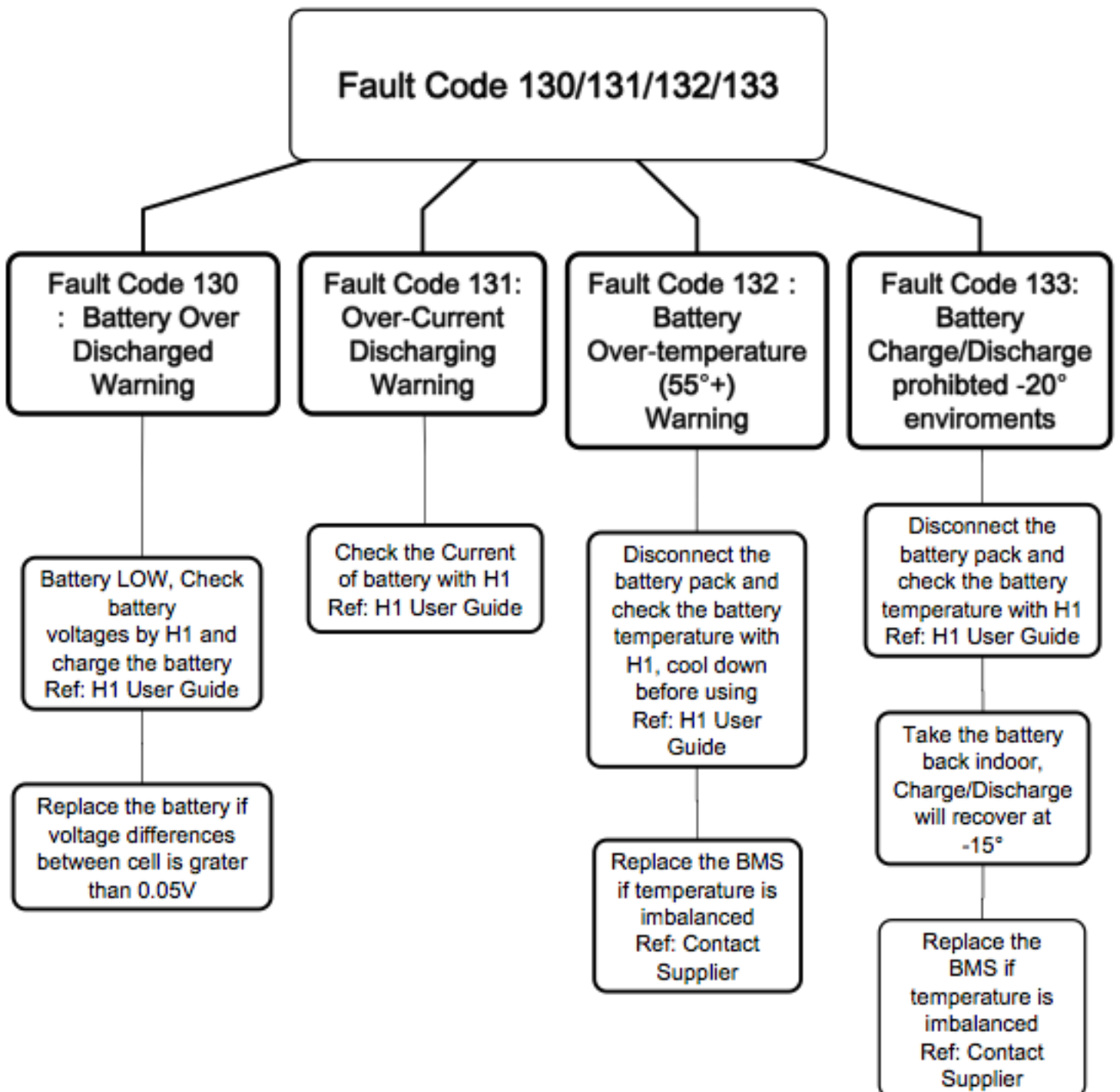




Diagnostic Code - 130/131/132/133 on display



Fault Code 130/131/132/133

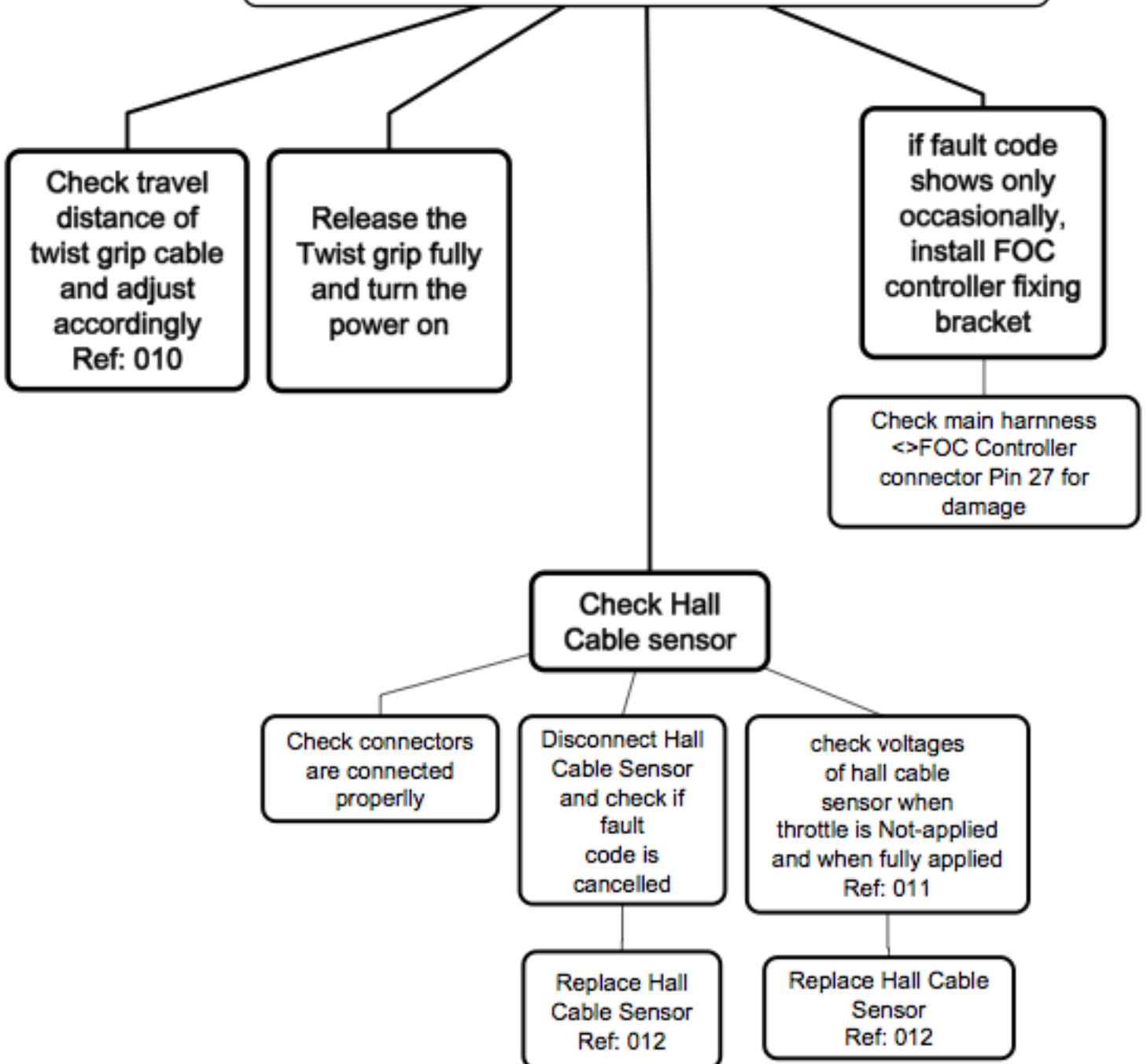




Diagnostic Code - 140 on display

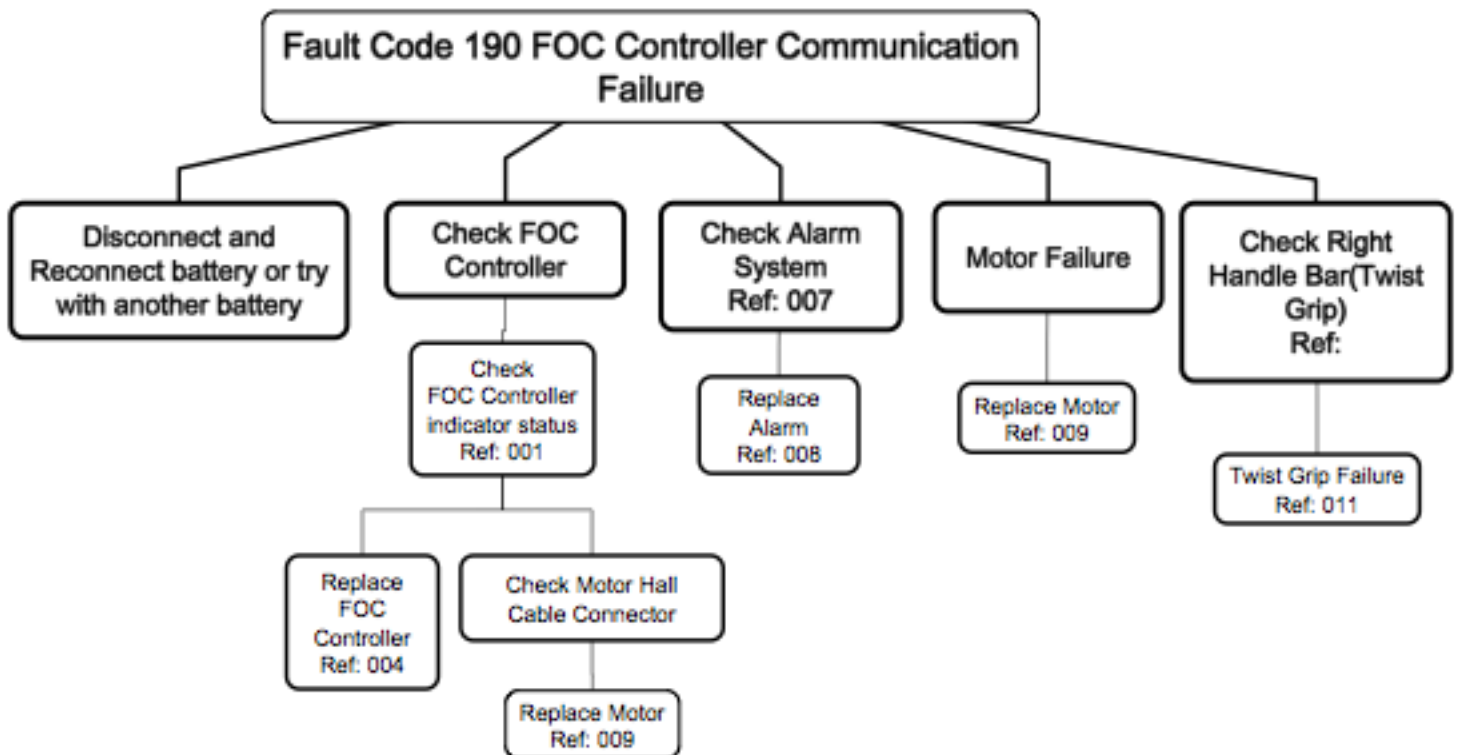


Fault Code 140: Hall Cable Sensor Failure



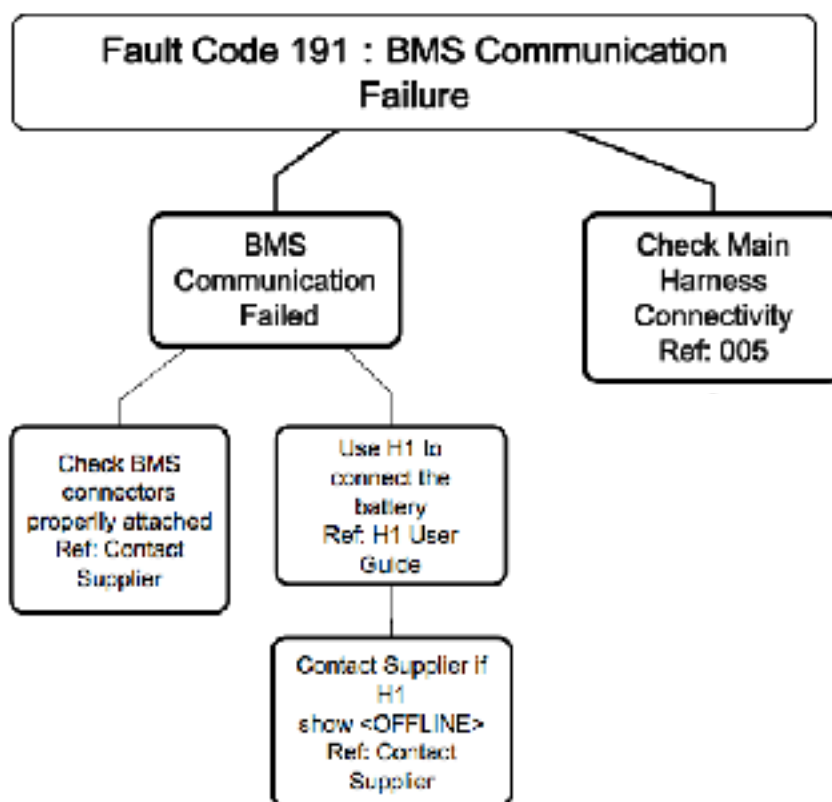


Diagnostic Code - 190 on display





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	
	BMS 29Ah setting (60V29Ah pack only)	



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.



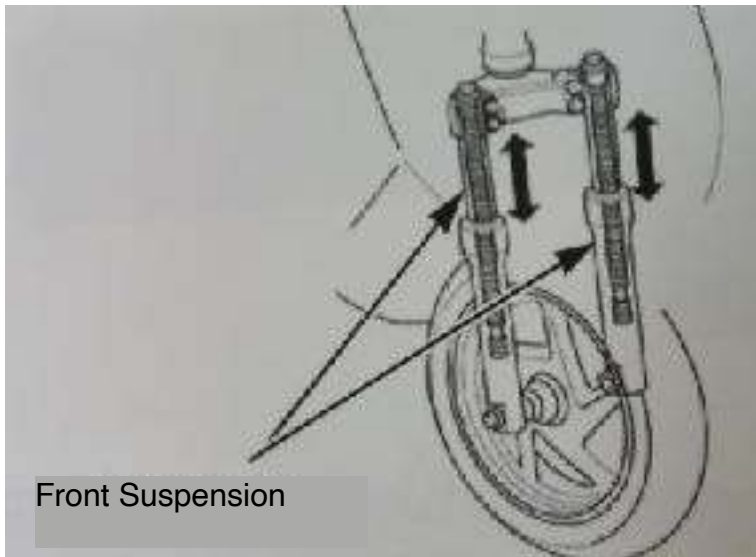


Regular Maintenance Checklist

Inspection of Suspension system

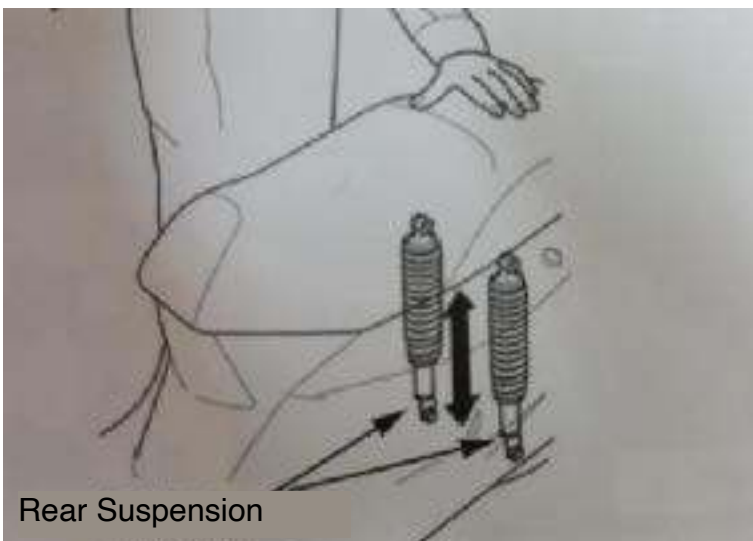
Front suspension

- 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.



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.





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

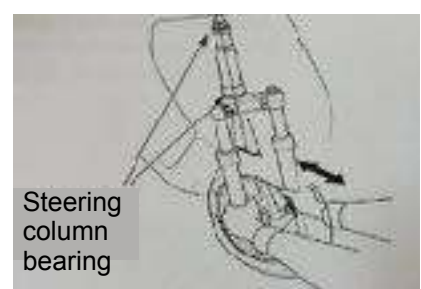
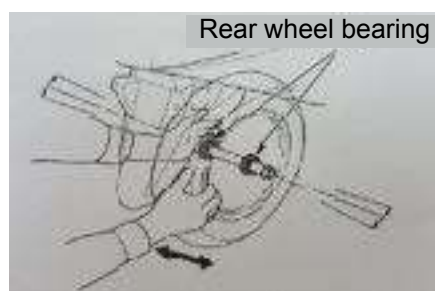
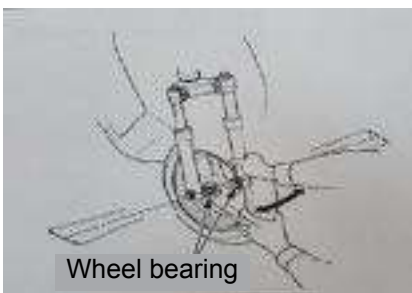
Tightened section and fastener name	Tightening Torque (Nm)
Installation screws on the front hydraulic brake plate	8Nm
Tightening bolts on the front shock absorber	28Nm
Tightening bolts on the fixed handle seat cover	8Nm
Tightening bolts on the welded steering handle assembly	52Nm
Front axle	60Nm
Installation 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

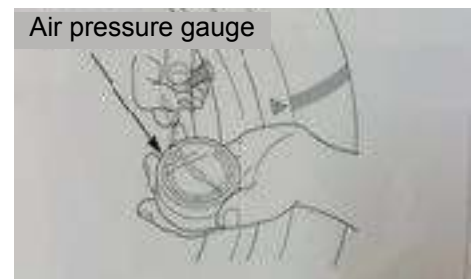
- Support the scooter with the Central Stands.
- Lift up the Front/Rear Wheel to check range of the free travel.
- Hold the Front/Rear Wheel and try to move it leftward and rightward to check the front wheel bearing for wearing.
- Replace the Front/Rear Wheel bearing if it becomes loosened.
- Turn the 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.



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

Front tire	20-25psi
Rear tire	26-32psi

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

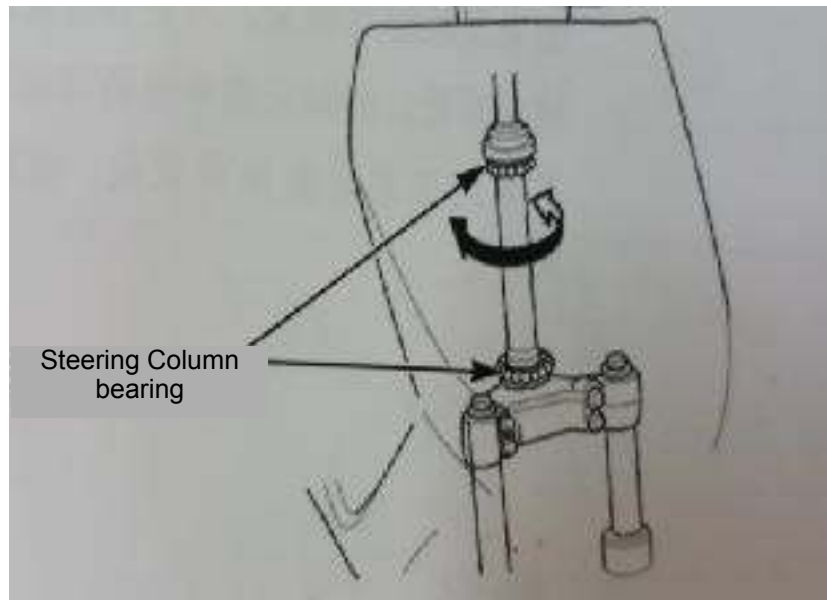




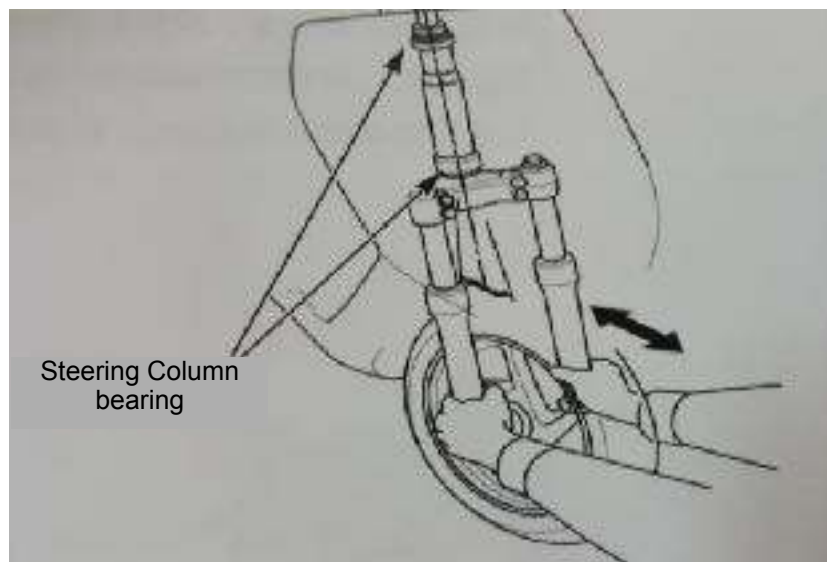
Regular Maintenance Checklist

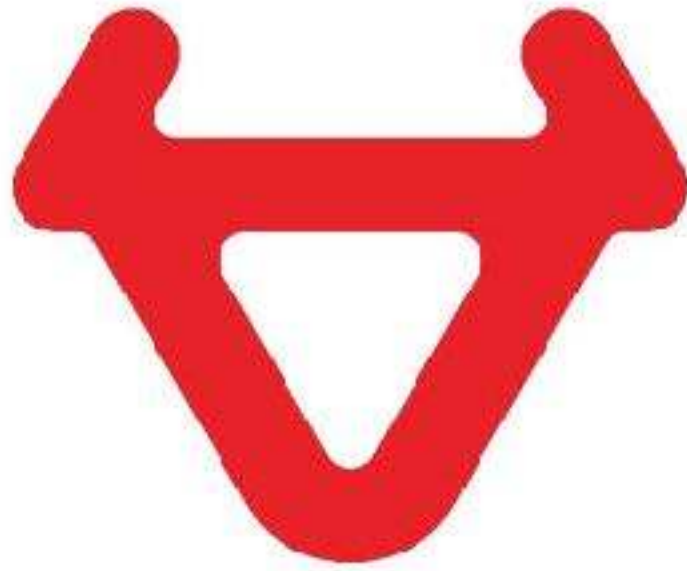
Steering column bearing

- 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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