

# REPAIR MANUAL

## Speedy

Vers. 2017\_01



**RiDE**

It is important that you read this repair manual carefully before the start of work.  
Only use **RIDE/ KSR spare parts**.

Ride Motorcycles is a registered brand by KSR Group GmbH.

This vehicle can only fulfil the demands placed on it if the service work is made by qualified experts and in accordance with the service schedule.

The repair manual was written to correspond to the current state of this model.

We reserve the right to make changes in this manual in the interest of technical advancements and improvements without a notice.

It is recommended that repair work will be done by a fully educated mechanic.

We will not provide descriptions of general workshop methods, safety rules that necessary in a workshop.

All specifications refers to the current states and are nonbinding. KSR Group GmbH specifically reserves the right to modify the information in this manual without notice and without specifying reasons.

KSR Group GmbH accepts no liability deviations from illustrations and descriptions or misprints and other errors.

The models in this manual partly contain special equipment that does not belong to the regular scope of delivery further the illustrations and pictures are symbolic images, and may differ from the actual components.

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## WARRANTY

The work prescribed in the service schedule must be carried out in an authorized workshop and confirmed in the customer's service card, otherwise no warranty claims will be recognized. No warranty claims can be considered for damage resulting from manipulations and/or alterations to the vehicle.

## NOTES AND WARNINGS

Pay attention to the notes/warnings in this manual.

### **⚠WARNING**

- Identified dangers that will lead to environmental damage if the measures are not taken.
- Identified dangers that is likely to lead to fatal or serious injury if the measures are not taken.
- Identified dangers that will lead to considerable machine and material damage if the measures are not taken.
- Identified dangers that will immediately lead to fatal or serious permanent injury if the appropriate measures are taken.

## REPAIR MANUAL

It is important that you read this manual completely before the start of work. It contains useful information how to repair and maintain the vehicle.

## SPARE PARTS AND ACCESSORIES

Only use spare parts and accessory that have been approved or recommended by KSR Group GmbH.

## PRACTIC

Special tools are required for some work but mostly professional work shop equipment is enough for service, repair and maintenance of the vehicle. Special tools mentioned inside of this manual. When thread locker is used on connections (e.g., Loctite®), follow the instructions for use from the manufacturer.

After disassembly, clean the parts that are to be reused and check them for damage and wear. Replace damaged or worn parts.

## IMPORTANT

- After each repair or maintenance work security check and a test drive must be done.
- Before you delivery the vehicle to the customer a road safety test must be done.
- Tighten the bolts of large diameter or the inner ones first, then screw down to the required orders of diagonal, unless otherwise specified.
- Rinse the parts disassemble with cleaner fluid, lubricate all the lubricating surfaces required before assembly.

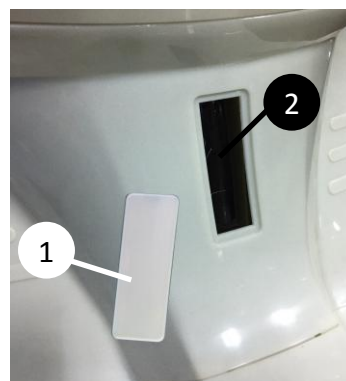
# LOCATION OF SERIAL NUMBERS

6

## VIN (CHASSIS NUMBER)车架号

Remove the cover vehicle identification(1).

The vehicle identification number(VIN)(2) is stamped into down-tube in front of the frame.



## FRAME PLATE 铭牌

The frame plate(1) is fixed on the right-side of the frame.



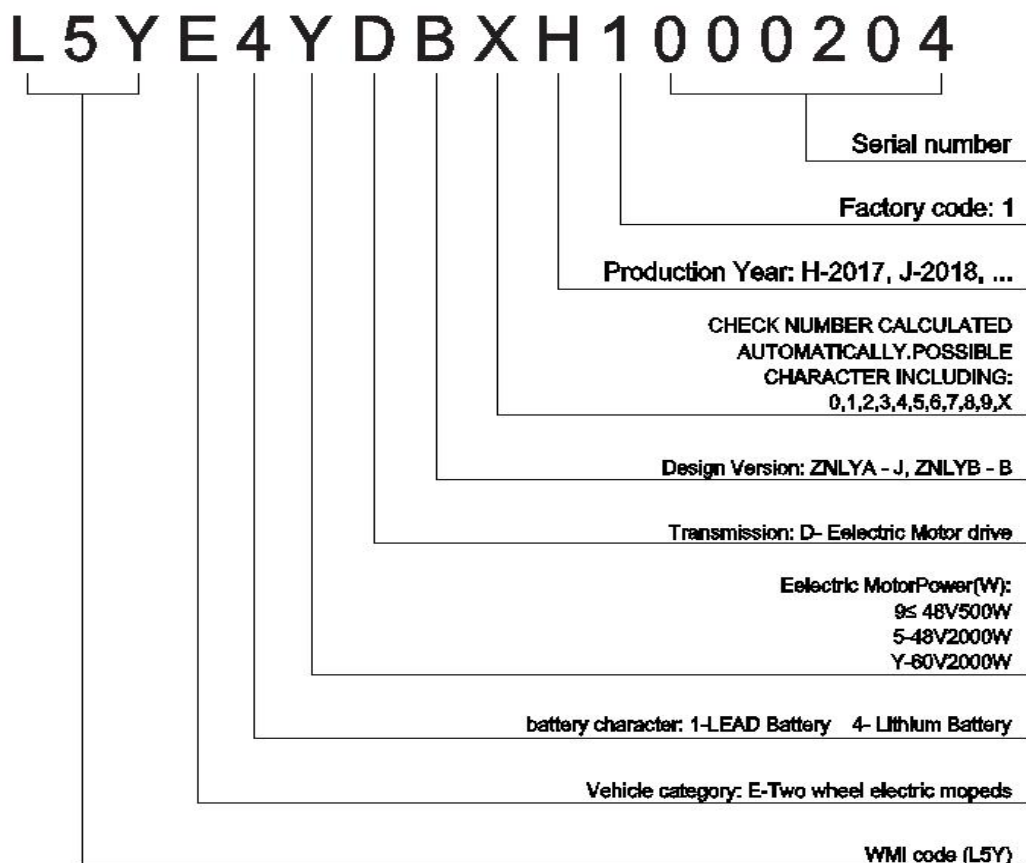
## MOTOR NUMBER 电机号

The motor number (1) is stamped into motor cover.



## DECRYPTING THE VEHICLE IDENTIFICATION NUMBER

EXAMPLE: L5YE4YDBXH1000204



# GENERAL SPECIFICATION

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## MOTOR

Motor type: Brushless DC Electric motor  
Motor voltage: 60 V  
Maximum power:2000W  
Maximum torque:99N•m  
Motor System 80% efficiency platform:10.5N•m-62 N•m  
Maximum speed:45km/h

## ELECTRIC DEVICE

Battery type: Lithium Battery  
Battery capacity : 20Ah  
Total voltage: 60 V  
Amount: 2 pieces

## CONTROLLER

Voltage: 60 V  
Current limiting: 45A  
Undervoltage: 48 V  
Phase angle: 120°

## TRANSMISSION

Drive system: DC motor in wheel hub

## CHASSIS

Frame type: Steel tube backbone

## TIRES

Front tire  
Type: Tubeless/ Pressure on cold tire: 2.5 bar  
Size:Rim:MT2.15×12  
Tire: 90/90-12

Rear tire  
Type: Tubeless/ Pressure on cold tire: 2.5 bar  
Size:Rim:J12×2.15  
Tire: 120/70-12

## BRAKES

### Front brake

Type: Single Hydraulic disc brake (180 mm)/ Right hand operation  
Brake fluid:DOT3 or DOT 4  
Recommended brake fluid:(CASTROL SUPER DISK BRAKE FLUID DOT4)

### Front brake

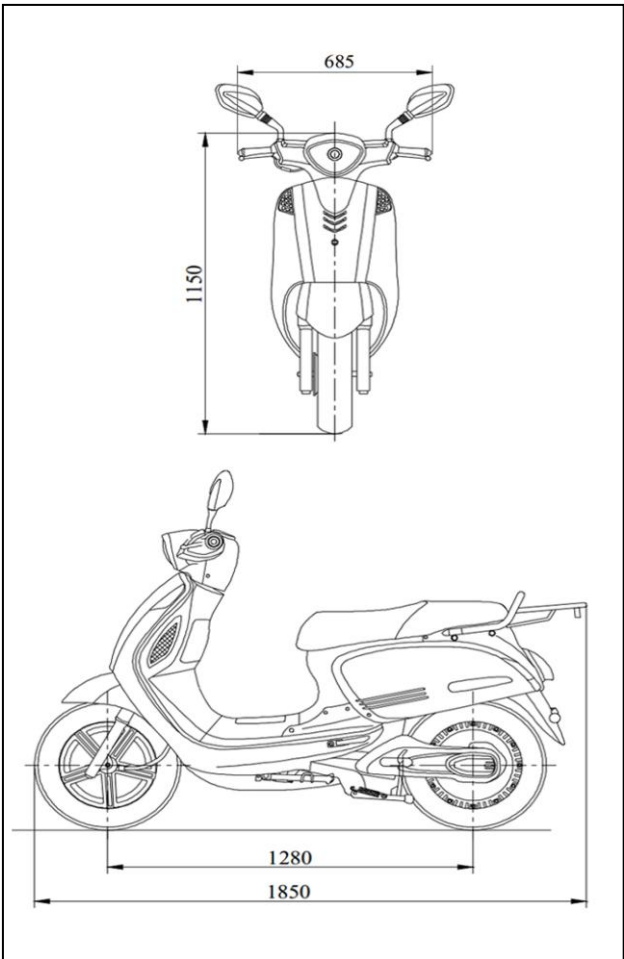
Type: Mechanical Drum brake (110 mm)/ Left hand operation

## FRONT SUSPENSION

Type: Telescopic fork  
Spring/shock absorber type: Coil spring/oil damper

## REAR SUSPENSION

Type: Unit swing 类型  
Spring/shock absorber type: Coil spring/oil damper



## LIGHT AND BULBS

Headlight - Halogen bulb	12 V, 35 W/35W
Tail/brake light	12 V, LED
Front turn signal light	12 V, LED
Rear turn signal light	12 V, LED
License plate light	12 V, LED
Meter lighting	12 V,2 W
Diagnostic Trouble light	5 V,LED

## TABLE OF TORQUE FORCE OF FASTENERS

Name of fastening parts and fasteners	Tightening torque (N•m)
Mounting bolt of front brake cylinder assembly	22-29
Fixing bolt of disc brake handle	5-9
Fixing bolt of handlebar welding assembly (M10)	40-45
Front wheel spindle locking nut (M12)	68-85
Front absorber fixing nut (M12)	55-62
Rear wheel fixing nut (M16)	100-113
Rear absorber top nut (M10)	37-44
Rear absorber bottom nut (M8)	22-29
Rear rack fixing bolt (M6)	22-29
Helmet box fixing bolt (M6)	5-9

## GENERAL TIGHTENING TORQUES/ BOLTS

9

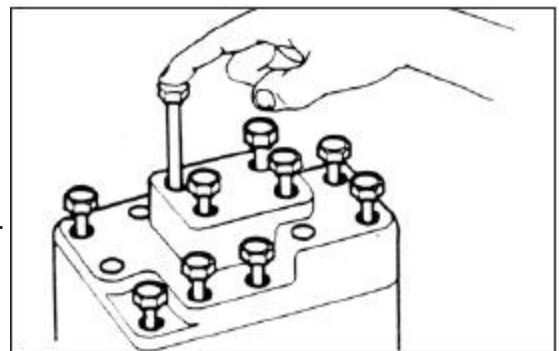
If no specific torque is given for a bolted assembling use the table below to tighten the screws. If you release a bolted and glued assembling it must be glued in assembling again. For the bonding of screws use Loctite ® 243 ™, follow the instructions for use from the manufacturer.

MAXIMUM TORQUE IN NM REFERRING ISO 898/1 FOR METRIC FASTENERS/COEFFICIENT OF FRICTION 0.12			
SIZE	*Strength(R)3,6	*Strength(R)8,8	*Strength(R)12,9
M1.6	0,047Nm	0,169Nm	0,285Nm
M2	0,10Nm	0,35Nm	0,60Nm
M2.5	0,21Nm	0,73Nm	0,12Nm
M3	0,36Nm	0,12Nm	0,21Nm
M4	0.82Nm	3.0Nm	5.1Nm
M5	1.6Nm	5.9Nm	10.0Nm
M6	2.8Nm	10.1Nm	17.4Nm
M8	6.8Nm	24.6Nm	42.2Nm
M10	13.7Nm	48Nm	83Nm
M12	23Nm	84Nm	144Nm
M14	37Nm	133Nm	229Nm
M16	57Nm	206Nm	354Nm
M18	80Nm	295Nm	492Nm
M20	112Nm	415Nm	692Nm

\*The value R(strength) indicates the material property, The lower the value of R is the lower the torque of the bolts.

The length of bolt or screw is different in terms of assembly parts and protective plate.

It should be installed in the right position, if confused, place the bolt into the hole to check whether it fits or not.



# SPECIAL TOOLS

10

Special tools are required for some work but mostly professional work shop equipment is enough for service, repair and maintenance of the vehicle.

After disassembly, clean the parts that are to be reused and check them for damage and wear. Replace damaged or worn parts.

NAME	REMARKS
Spacer gauge	Figure 1
Inner hexagon wrench	Figure 2
Micrometer	Figure 3
Dial indicator	Figure 4
Magnetic stand, V-shape block	Figure 5
Steering nut wrench	Figure 6
Steering nut wrench	Figure 7
Universal meter	Figure 8
Brake bleeder device	no picture

Figure 1

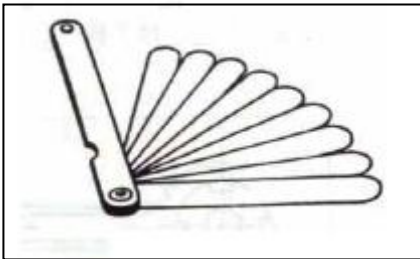


Figure 2

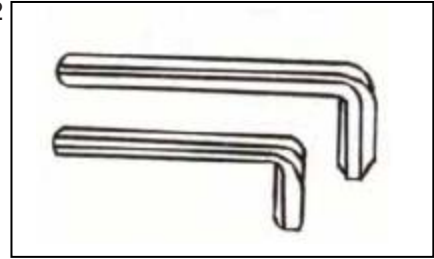


Figure 3



Figure 4



Figure 5

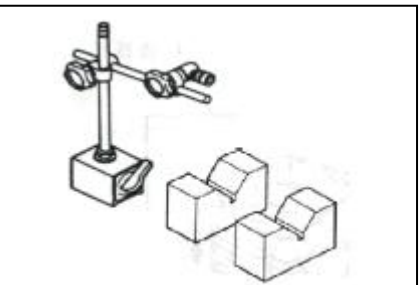


Figure 6

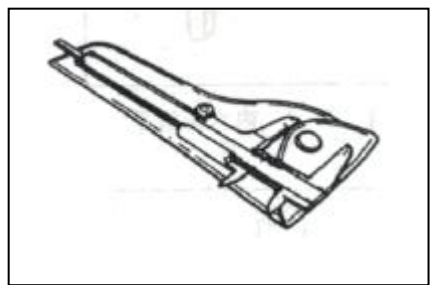


Figure 7

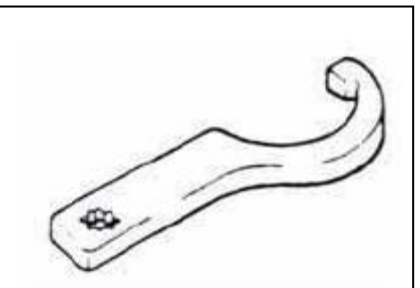


Figure 8





# **1. TIPS FOR USING THE FOUR MAJOR ELECTRICAL PARTS**

## 1. CHARGER

1. When charge the battery with a charger, first plug of the charger then the input one. During the charging, both the power indicator and charging indicator of the charge show red. The charging indicator turns to green after full charged. When stop charging, unplug the input first and then the output plug of the charger.
2. The charger should be provided with protection against moisture and damp during the using and be put in a well-ventilated place.
3. As a kind of precise electronic equipment, the charger should be protected against vibration during using and better not to carry it with the electrovehicle.  
In case the charger is damaged, charge the battery with a charger in same brand, type, voltage and charging current, otherwise it will lead to negative effects on the battery or damage the charger again.

## 2. CONTROLLER

1. Controller is the component to control the motor speed and also the core of the power driven system of the electrovehicle. The controller features the functions of undervoltage current-limiting and overcurrent protection.
2. Controller, the key part of the electrovehicle on energy management and signal processing, is a kind of precise electronic equipment and should be protected against the immersion of rain water.
3. In case the controller is damaged, do not disassemble by yourself. Send the damaged controller to professional maintainer or original manufacturer for repair.

## 3. MOTOR

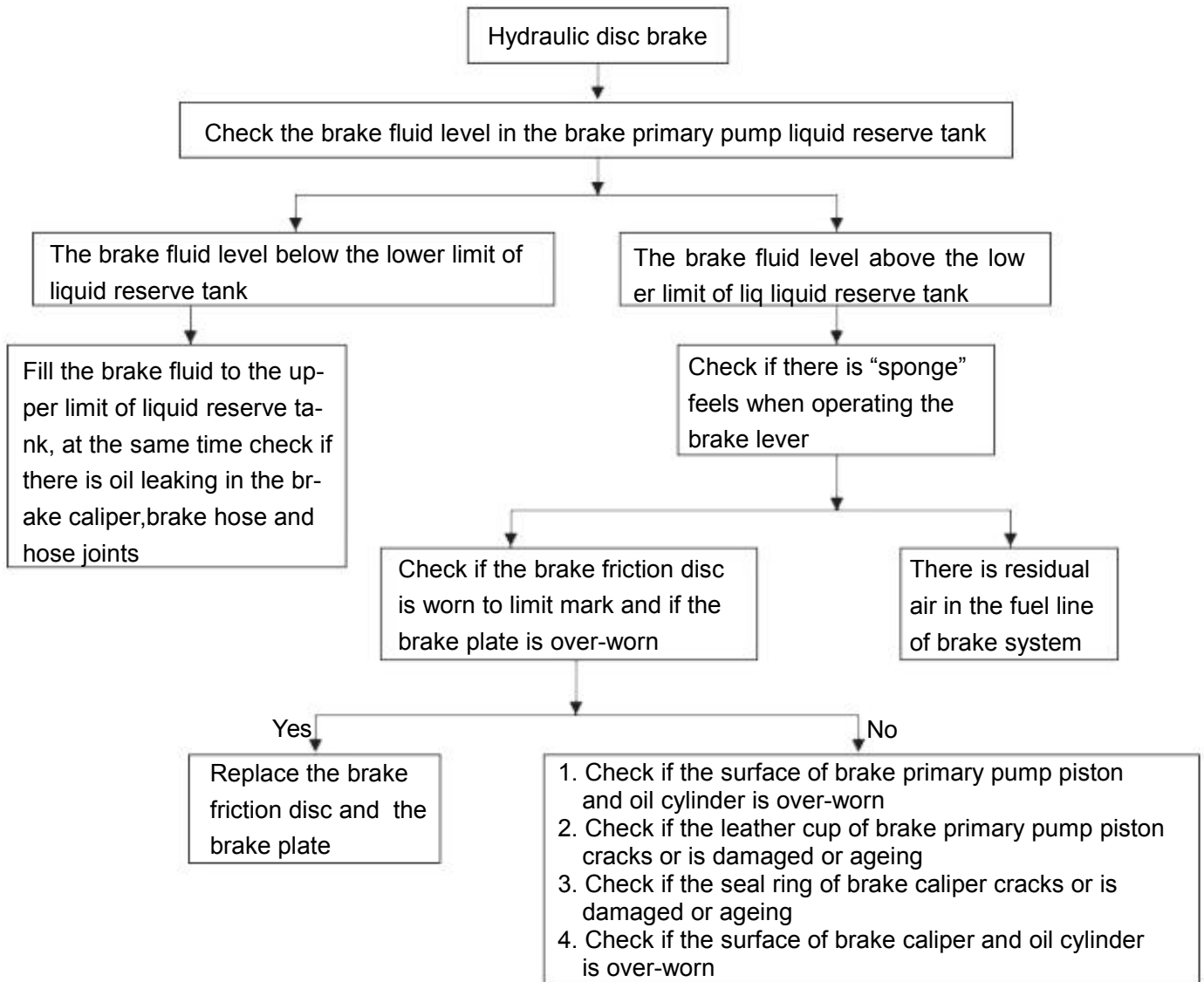
1. Brushless and gearless motor is adopted in this electrovehicle. Prevent the center of the motor against the water during driving, otherwise it will affect the service life of the motor.
2. In case the motor is in excess temperature (25° above the environment temperature) after a period of driving, Send it to professional maintainer for repair.

## 4. BATTERY

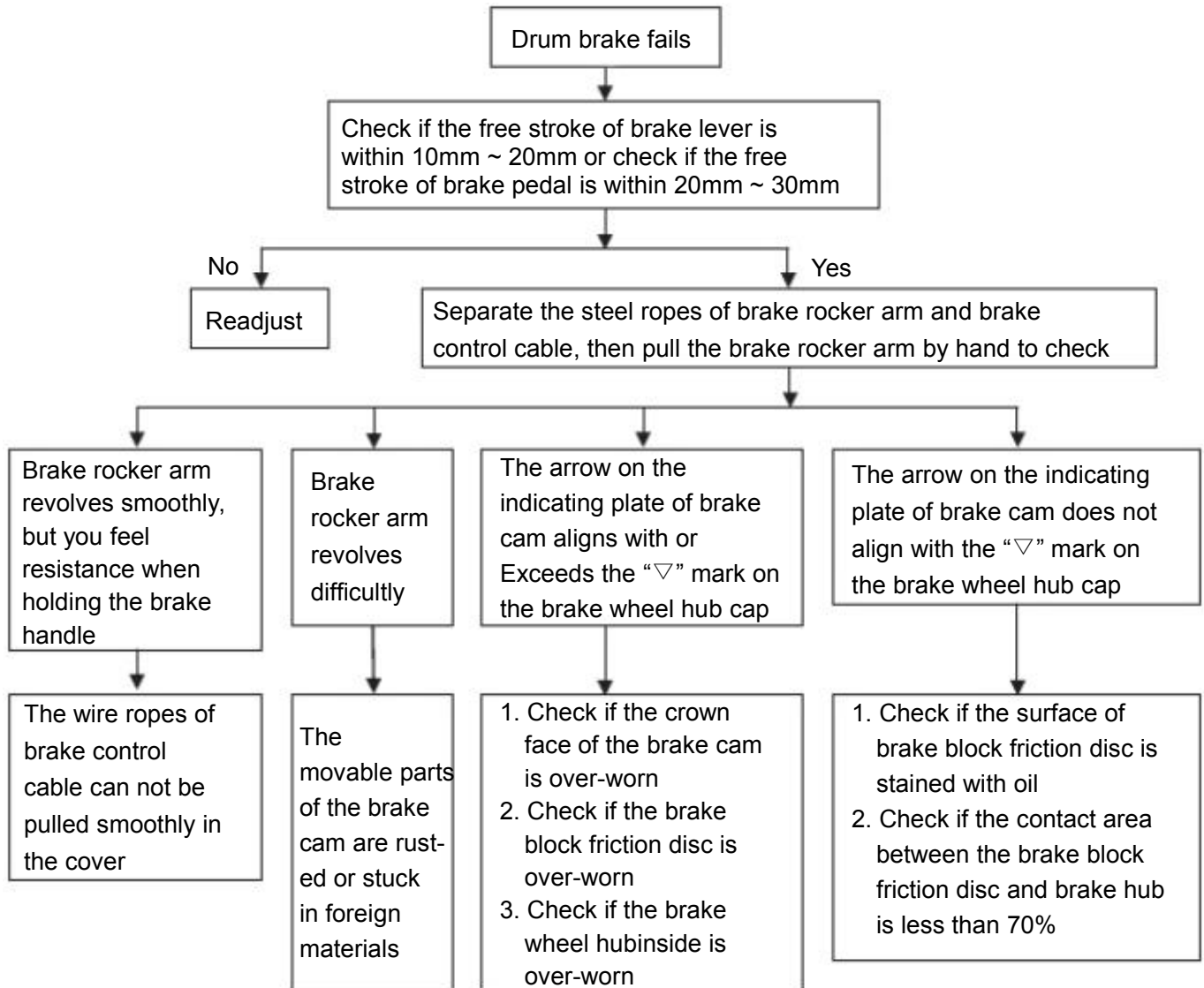
1. It suffers a period of turnover time from the delivery to the use of the electrovehicle, while the battery will be in self internal discharge during the storage, consume some electric quantity and fail to reach the rated capacity; therefore it would be best if the user make boost charge before initial use.
2. To develop a habit of frequent charging and avoid "deep discharging"; make one additional charging if long time no use.
3. There will be a small quantity of voltage after a period since the meter electric quantity shows no power for the battery, this is known as "recovery voltage", which could not be used for driving, otherwise it will lead to excessive "deep discharging" of the battery and affect its service life.
4. Keep the battery away from the combustion source and heat source. No direct insolation in the sun in hot seasons nor strenuous vibration, impact or positive/negative electrode short circuit. Keep the internal and external of the battery box clean.
5. Do not disassemble the battery at will to avoid danger. Take the scrapped batteries to recycling station (supplier) for unified disposal. Do not throw them arbitrarily to prevent environmental pollution.

## **2. FAILURE DIAGNOSIS**

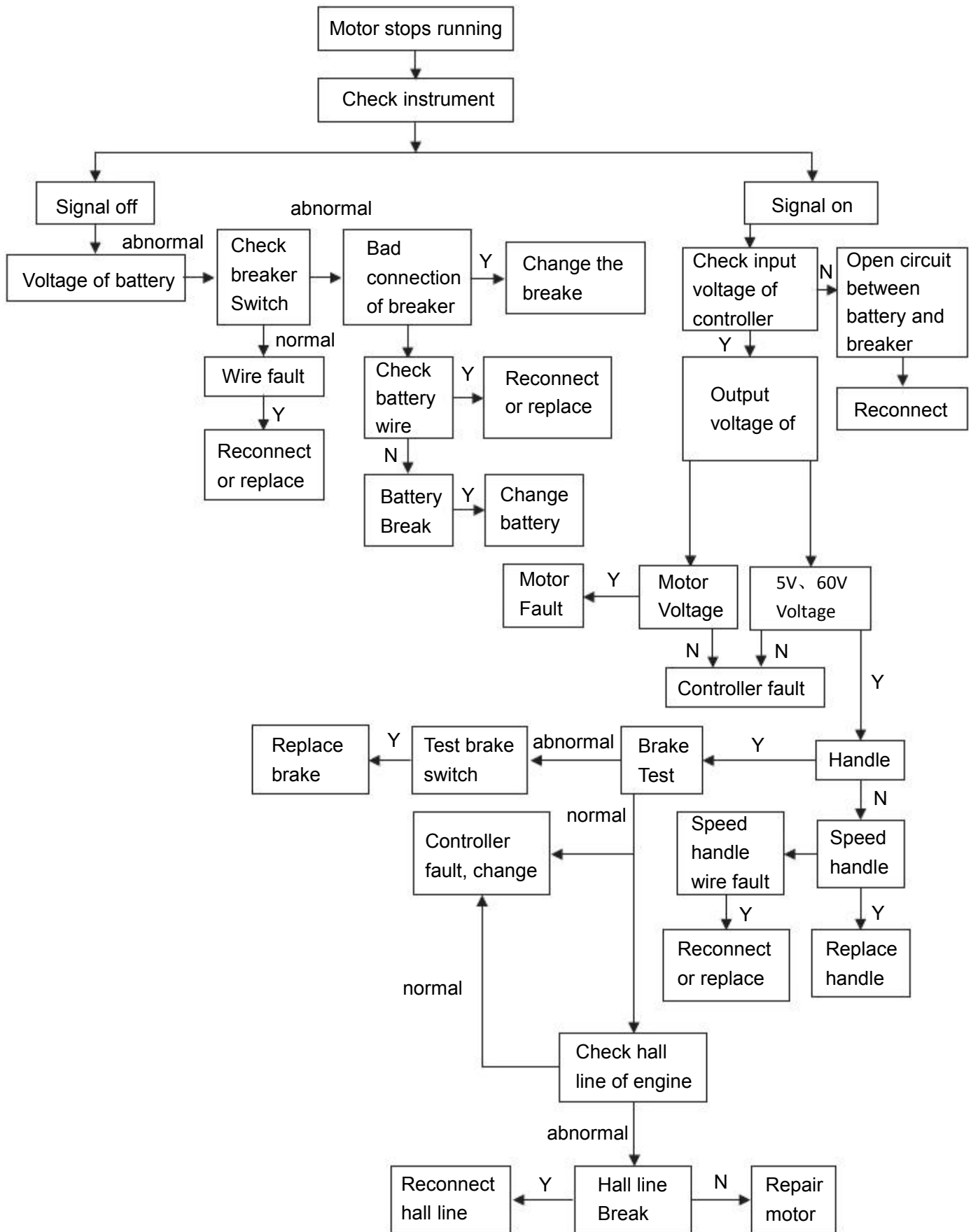
## FAILURE DIAGNOSIS PROCEDURE WHEN THE HYDRAULIC DISC BRAKE FAILS



## FAILURE DIAGNOSIS PROCEDURE WHEN THE DRUM BRAKE FAILS

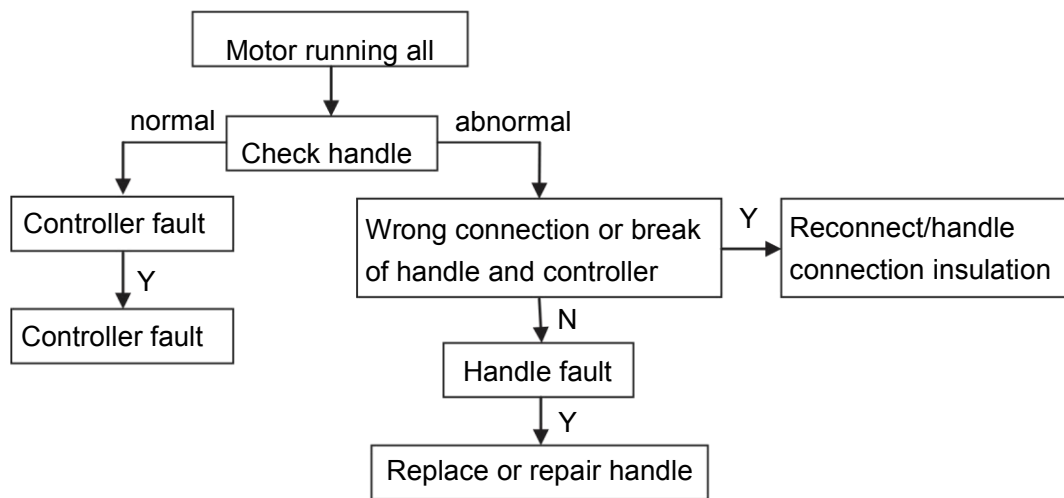


## FAILURE DIAGNOSIS PROCEDURE WHEN MOTOR STOPS RUNNING

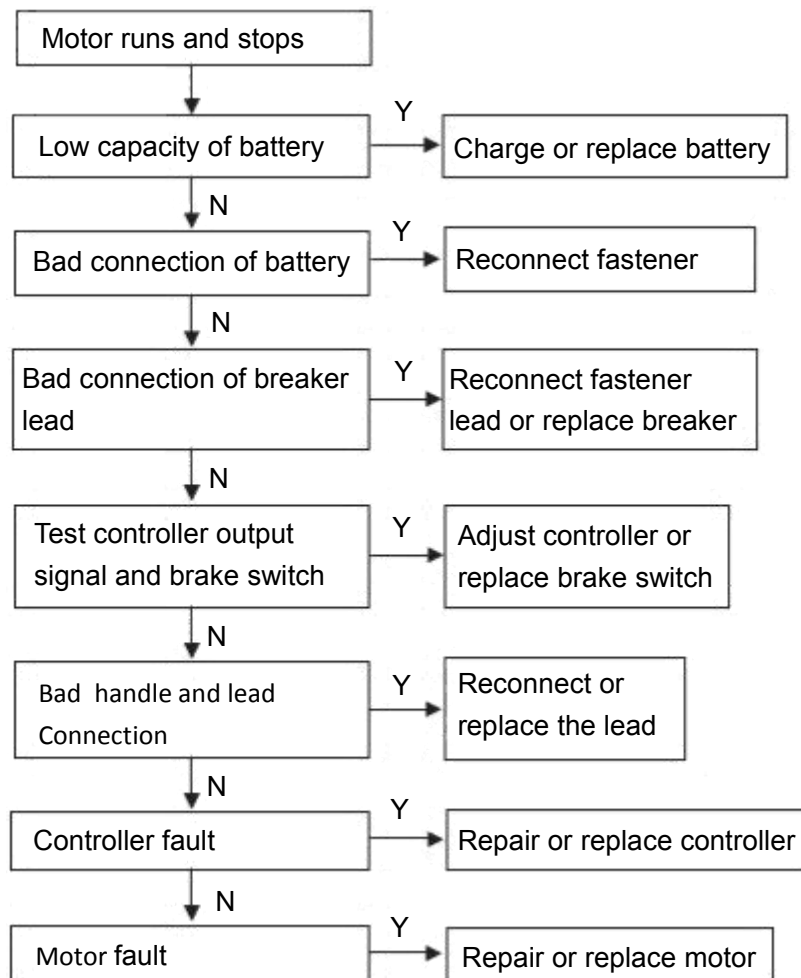




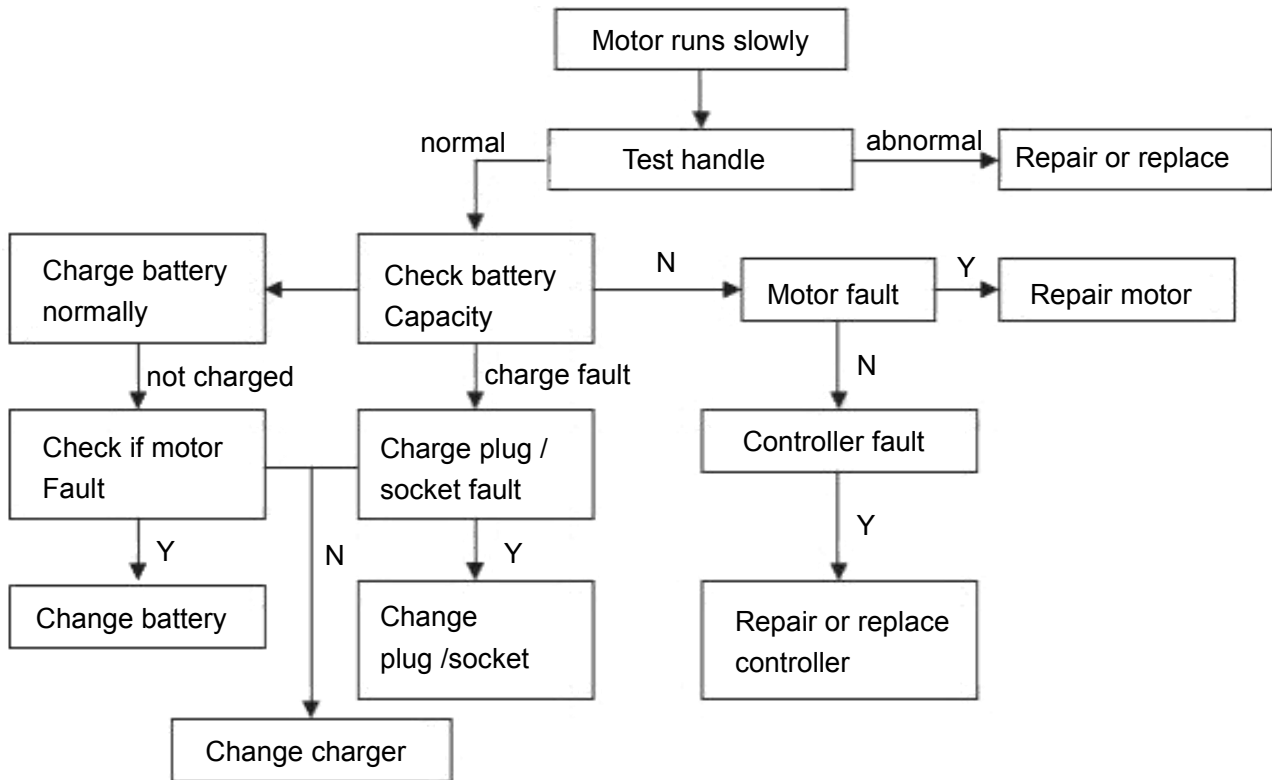
## MAINTENANCE PROCEDURE WHEN MOTOR WON'T STOP RUNNING



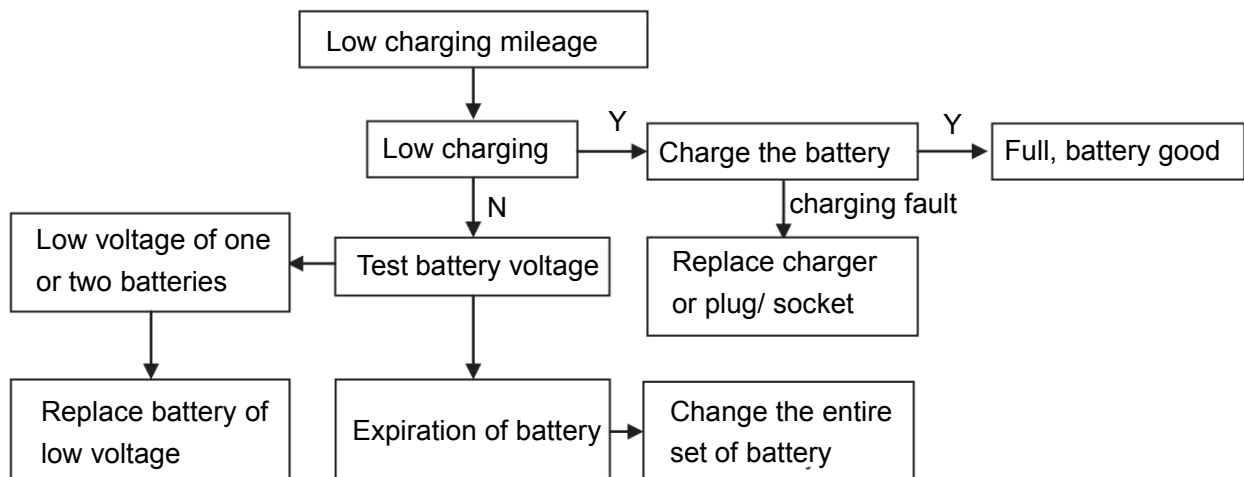
## MAINTENANCE PROCEDURE WHEN MOTOR RUNS AND STOPS EVERY NOW AND THEN



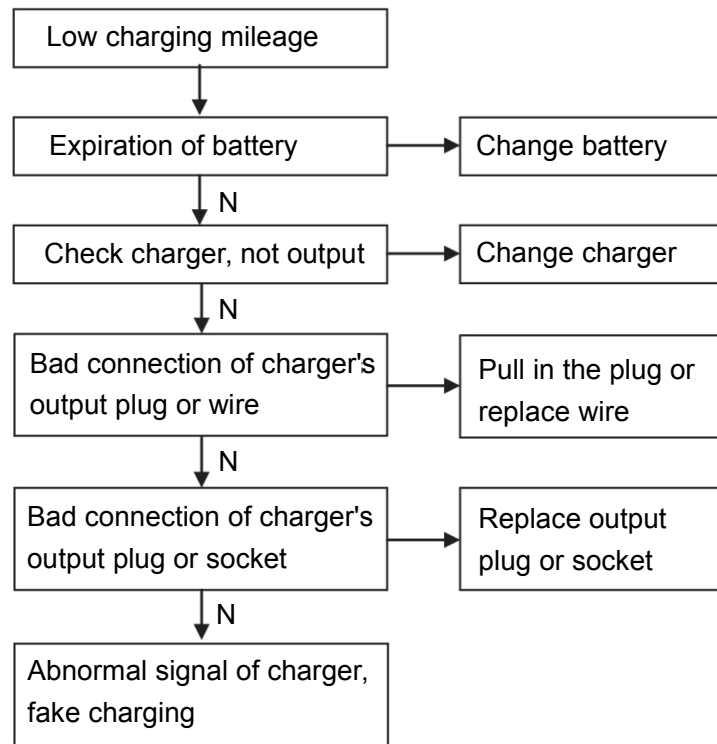
## MAINTENANCE PROCEDURE WHEN MOTOR RUNS SLOWLY



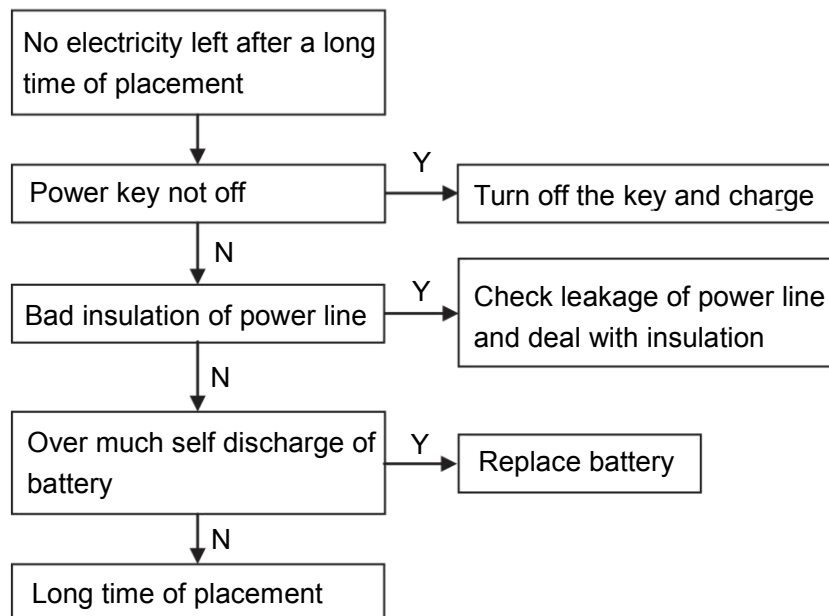
## MAINTENANCE PROCEDURE FOR BAD CHARGING



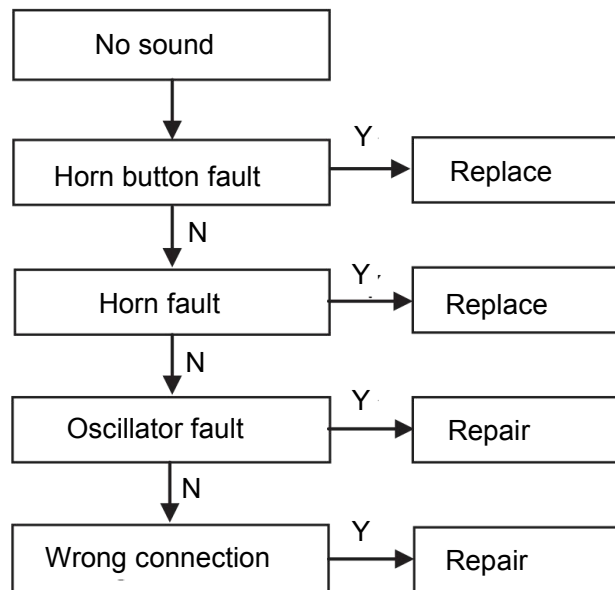
## MAINTENANCE PROCEDURE WHEN BATTERY CAN'T BE CHARGED OR CHARGED COMPLETELY



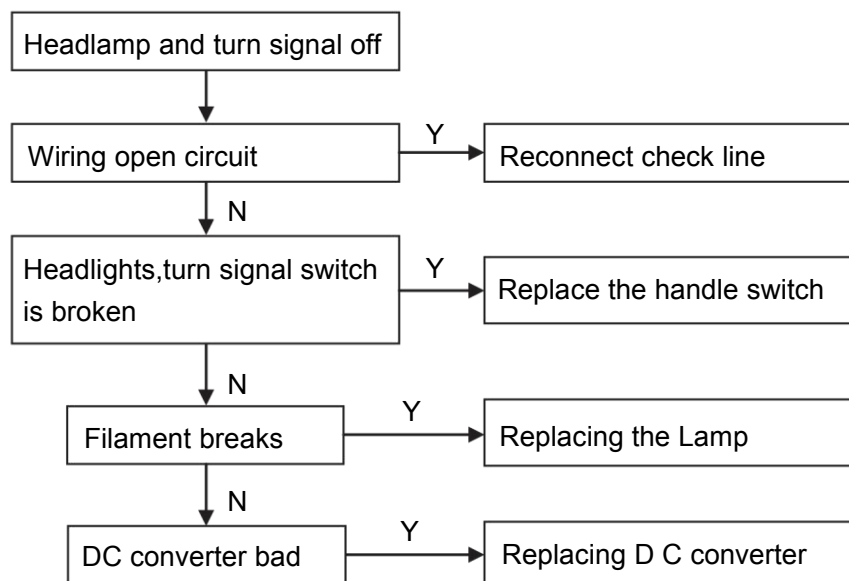
## MAINTENANCE PROCEDURE FOR NO ELECTRICITY OF BATTERY



## MAINTENANCE PROCEDURE WHEN HORN DOESN'T SOUND



## MAINTENANCE PROCEDURE WHEN HEADLAMP OR TURN SIGNAL OFF



## **3.FAULTS AND TROUBLE- SHOOTING**

Fault	Reason	Troubleshooting
Motor stops running and instrument panel signal off	1. Breaker fault	Test breaker or replace it
	2. Power lock fault	Replace the power lock
	3. Bad battery connection	Refasten the connection of battery
	4. Bad connection of cable	Adjust or replace connection
	5. Expiration of battery	Replace battery
	6. Open circuit of single battery	Replace battery
Motor stops running and instrument panel signal on	1. No voltage at input end of controller	Check and repair connection between power supply and controller
	2. No supply from controller to motor	Controller fault, replace it
	3. Speed handle damage	Replace speed handle
	4. Brake power off switch damage	Replace brake switch
	5. Controller fault	Replace controller
	6. Brake lever lead breaks	Reconnect or replace lead
	7. Motor fault	Repair or replace the motor
	8. No output voltage of controller	Replace controller
Motor stops running	1. Breakdown of power field-effect transistor of the controller	Repair or replace controller
	2. Fault of speed handle	Repair or replace speed handle
	3. Wrong connection of speed handle	Repair speed handle or reconnect the lead
Slow running of motor	1. Speed limit plug unplugged	Unplug the plug
	2. Motor fault	Repair or replace motor
	3. Battery aging, insufficient charging or can't be charged	See on page 19. (Maintenance procedure when battery can't be charged or charged completely)
	4. Speed handle fault	Repair or replace speed handle
	5. Controller fault	Repair or replace controller
	6. Mechanical fault (rear braking too tight)	Check and repair mechanical fault (adjust braking)
Power failure	1. Controller damage	Replace controller
	2. Short circuit	Handle insulation
Motor runs and stops every now and then	1. low voltage of battery	Charge the battery completely
	2. expiration of battery	Replace the battery
	3. bad connection of battery lead	Retighten lead or replace
	4. bad connection or damage of breaker	Retighten lead or replace the breaker
	5. damage of power lock or bad connection	Replace power lock
	6. fault of brake power switch	Replace brake power switch or lead
	7. break of speed handle lead	Replace handle or lead
	8. bad component connection	Readjust component connection
	9. controller fault	Repair or replace controller
	10. motor fault	Repair or replace motor
Overload or abnormal of motor noise	1. Wearing of motor bearing	Replace bearing
	2. Bad wearing of motor bearing	Replace motor or bearing
	3. Failing off of motor magnet	Replace motor



Fault	Reason	Troubleshooting
Overload motor current	1. Water in motor	Dry or replace the motor
	2. Failing off of motor magnet	Replace motor
	3. Burning of commutator insulation	Replace motor (replace commutator)
	4. Short circuit of armature winding	Replace motor (replace lead)
	5. overload or over large of angle	Load less than 150kg grade less than 5°
Controller damage	1. Wrong connection of battery	Check power supply and replace controller
	2. Water in controller	Replace controller
	3. Short circuit of loading	Remove short circuit or replace controller
	4. Overload	Correct controller lead
	5. Quality problem of controller	Replace controller
	6. Bad welding of controller	Replace controller
Short driving milage of charging once	1. Expiration of battery	Test and replace battery
	2. Insufficient charging of battery	See on page 19. (Maintenance procedure when battery can't be charged or charged completely)
	3. Low voltage of one or two batteries in the set	Replace one or two batteries
	4. Short circuit of motor	Repair or replace motor
	5. Loss of field of motor magnet	Repair motor
	6. Controller fault	Repair or replace controller
	7. Low output voltage of charger	Replace charger
Insufficient charging of battery or can not be charged	1. Expiration of battery	Replace battery
	2. No output voltage of charger	Replace charger
	3. Abnormal output voltage of charger	Repair or replace charger
	4. Bad connection between charger and power supply	Switch on or replace power supply wire
	5. Bad connection between output plug of charger and supply	Replace socket connection lead or charging socket
	6. Abnormal signal of charging, fake charging	Repair or replace charger
Motor runs without instrument panel signal	1. Break of lead from power supply to instrument panel	Check and replace lead
	2. Instrument panel fault	Check an repair panel
No sound of horn	1. Horn switch fault	Replace switch or clean unnecessary oxygenation layer
	2. Horn oscillator circuit break	Check and repair oscillator or replace horn
	3. Wrong horn lead connection	Check and repair lead
Headlamp or turn signal off	1. Headlamp or turn signal fault	Replace
	2. Filament break	Replace bulb of same specification
	3. Filament circuit break	Replace lead
	4. Direct current converter damage	Replace direct current converter
Battery deformation (expansion)	1. Inconsistent battery load	Replace battery
	2. Increasing resistance of battery sulfate	Replace battery

Fault	Reason	Troubleshooting
No electricity of battery	1. Power lock open, power consumption of controller and instrument panel.	Charging
	2. Bad insulation of power line	Check and repair the line
	3. Inconsistent of battery terminal voltage, self discharging of battery	Repair or replace battery
	4. Over long placement of battery	Fully charge before a long time of replacement
Damage once charged	1. Wrong battery connection	Check and repair lead
	2. Wrong connection of plug or socket	Check and repair
	3. Short circuit of socket lead	Check and repair short circuit and replace socket
Quick decreasing of voltage after replacing a new battery	1. Inconsistence between instrument and panel and battery	Check and repair instrument panel
	2. Short circuit or bad connection	Check and repair short circuit and retighten lead
	3. Large operation current for motor	Repair or replace motor
	4. Low battery capacity	Maintenance charging for battery

## **4. PERIODIC MAINTENANCE**

## 26

**Important maintenance work have to be carried out by an authorized workshop.**

The inspection intervals are required,otherwise,no guarantee can be granted		300km	2000km	4000km	6000km	8000km	10000 km
PART	TO DO						
Common check	Inspect	I	I	I	I	I	I
Steering handle assembly	Inspect /replace	I/R	I/R	I/R	I/R	I/R	I/R
Fittings, buttons and seal of vehicle	Inspect /adjust	I/A	I/A	I/A	I/A	I/A	I/A
Front and rear brakes	Inspect	I	I	I	I	I	I
Suspension system	Inspect	I		I		I	I
Electronic assembly	Inspect	I	I	I	I	I	I
Bearing of front and back wheels	Inspect /replace		I	R	I	R	I
Tire	Inspect				I		I
Steering bearing	Adjust /clean				A/C		A/C
Brake assembly	Inspect		I	I	I	I	I
Brake oil	Replace				R		
Suspending system - Front	Inspect	I	I	I	I	I	I
Suspending system - Rear	Inspect	I		I	I	I	I
Bracing wire	Inspect /replace			I	I	I	R
Battery terminal	Inspect				I	I	I
<b>A—ADJUST    C—CLEAN    I—INSPECT    R—REPLACE</b>							

## Brakes

Item	Standard value [mm]	Allowable limits [mm]
Front brake disc thickness	4.0	3.0
Front brake pad thickness	7.0	6.0
Front brake disc diameter	180	—
Inner diameter of rear drum brake	110	—
Thickness of friction piece in rear brake pad	4.0	3.0
Free stroke of front/rear brake lever	10-20	—

## Brakes

Item		Standard value [mm]	Limit for use [mm]
Rear wheel shimmy	Vertically		2.0
	Horizontally		2.0

## Rim/ Tyre-pressure

Specification		Pressure [BAR]
Front tire	90/90-12	2.0 ± 0.1
Rear tire	120/70-12	
Front rim	MT2.15×12	
Rear rim	J12×2.15	

## AIR PRESSURE INSPECTION

### ⚠WARNING

Low tire air pressure leads to abnormal wear and overheating Of the tire.

The tire pressure should be measured under cold condition.  
Use a conventional pressure gauge (1) to test the tire pressure.  
Correct tire air pressure ensures optimal riding comfort and maximun tire service life.

SPECIFICATION		PRESSURE [BAR]
Front tire	90/90-12	2.0 ± 0.1
Rear tire	120/70-12	
Front rim	MT2.15×12	
Rear rim	J12×2.15	



## WHEEL BEARING AND WHEEL AXLE DAMAGE INSPECTION

The wheels rotate with difficulties,sounds strange or have too much free play,the wheel-axle bearing (1) or the gear seats are in failure.

To locate the error, the wheel should be removed.

## BRAKE FLUID LEAK INSPECTION

If the brake fluid level falls below the MIN (1) mark,this Indicates a leakage in the brake system or worn-out brake linings.

1. Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
2. Check the brake fluid level.
3. Check the brake system and do not continue riding if the system is leaking.



## BRAKE OPERATION INSPECTION FRONT

1. Operate the hand brake lever until the brake pads lie on The brake disc and check if there is a pressure point. If there is no pressure point check the brake system.
2. While operate the front brake lever push forward and backward hard on the handlebar to check if the front system is working. If the brake do not work correct check the brake system.
3. Final make a driving test with low speed and check if the brake system is working. If the brake do not work correct check the brake system.



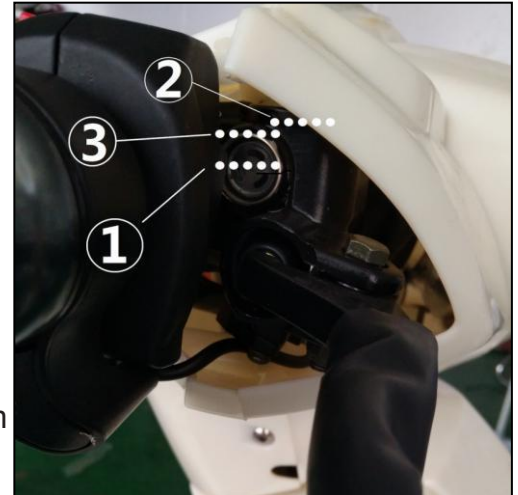


## ⚠ WARNING

Always keep the brake discs free of oil and grease, and clean them with brake cleaner when necessary. Please consider that a dirty brake disc influence the brake performance. Please consider that the front brake lever free play is not adjustable

### BRAKE FLUID LEVEL INSPECTION

After a certain time the brake pads start to wear out and the brake fluid level falls down. If the brake fluid level falls below the MIN (1) mark, check the brake pads or and the brake system for any leakage. Never add brake fluid only without checking the system.



1. Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
2. Check the brake fluid level.
3. Remove the cover with membrane (2).
4. Add brake fluid to the MAX level (3).
5. Mount the cover with membrane.

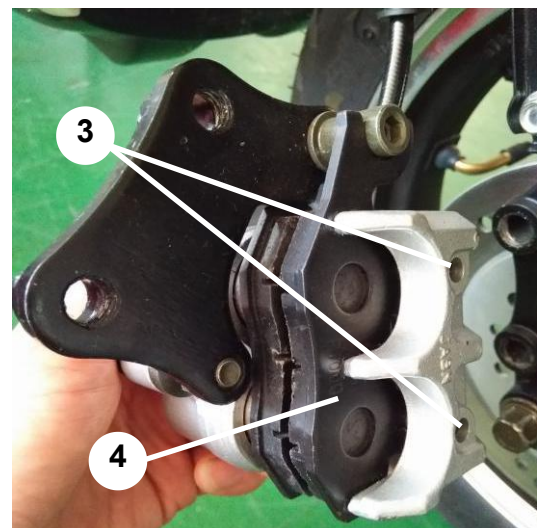
**RECOMMENDED BRAKE FLUID:**  
CASTROL SUPER DISK BRAKE  
FLUID DOT 4

### FRONT BRAKE PAD WEAR INSPECTION

## ⚠ WARNING

Reduced braking efficiency caused by worn pads. Change worn brake pads immediately. Always replace the Brake pads in pair.

1. Loose the mounting bolts (1) of the braking calliper bracket.
2. If the minimum thickness is less than the indicators (2), under **6 mm**, damage or cracking is visible change the front brake pads in pair.
3. Loosen the two mounting bolts (3).
4. Change the brake pads (4) in pair.
5. Reassemble in reverse order.



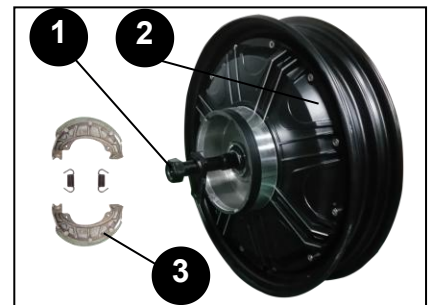
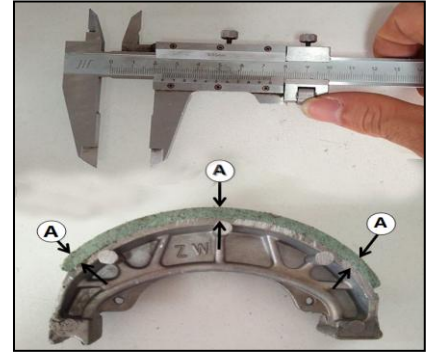
## REAR BRAKE PAD WEAR INSPECTION

Reduced braking efficiency caused by worn brake pads. Change worn brake pads immediately. Always replace the brake pads in pair.

1. Check the brake pads for minimum thickness.

**Allowable limit (A): 3 mm**

2. Remove the rear fork cover.
3. Remove the fixing nut (1) of the rear wheel (2).
4. Remove the brake pad (3).
5. If the minimum thickness is less than specified, damage or cracking is visible change the front brake pads.
6. Reassemble in reverse order.

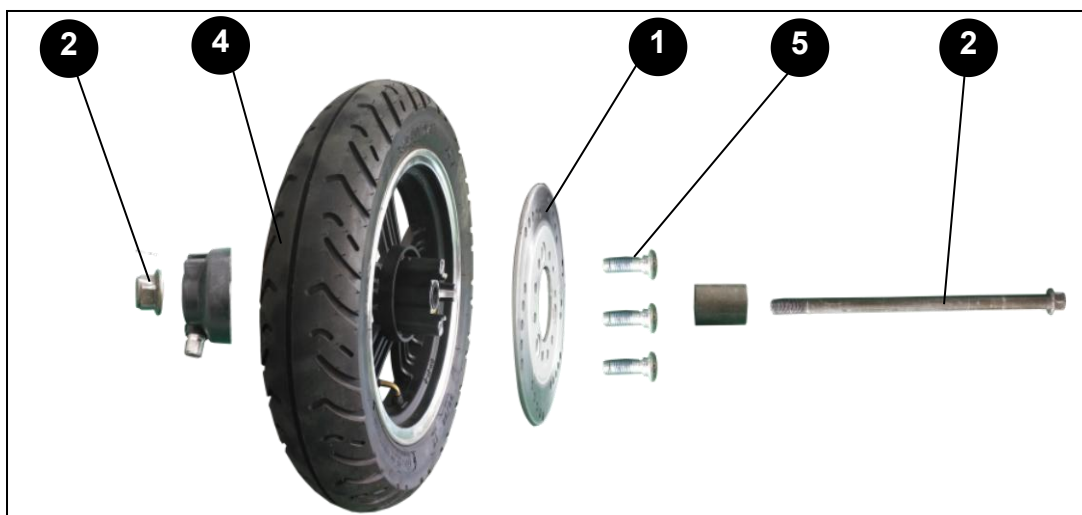


## BRAKE DISC INSPECTION

1. Check the thickness of the front disc at several places on the disc to see if it conforms to measurement.

**Allowable limit (A): 3 mm**

2. If the brake disc thickness is less than the specified value change the brake disk. Check the front disk for damage, cracking or deformation change the brake disk.
3. Loose the mounting nut (2) which fixing the axle (3) of the front wheel (4) in order to remove the front wheel and its axle.
4. Place an appropriate supporting stand to raise the front wheel up.
5. Remove the three screws (5) to remove the front brake disc (1) and mount a new one if the old one is worn.
6. Reassemble in reverse order.





## BRAKE DRUM INSPECTION

1. Check the bore of the rear disk drum at several places to see if it conforms to measurement.

**Allowable limit (A): Ø 111 mm**

2. If the bore is more than the specified value change the drum casing (1).
3. Replace the rear wheel (see page 29 ).
4. Remove the twelve allen screws (2).
5. If the minimum of bore is less than specified,damage or cracking is visible change the drum casing (1).
6. Reassemble in reverse order.



## BRAKE HOSE REPLACEMENT

When the front brake hose is leaking, cracked or worn you must replace it.

Please consider that there is no need to remove the brake calliper when you need to replace the brake hose.

### **⚠WARNING**

Brake fluid can cause skin irritation on contact.

Avoid contact with skin and eyes, and keep out of the reach of children.

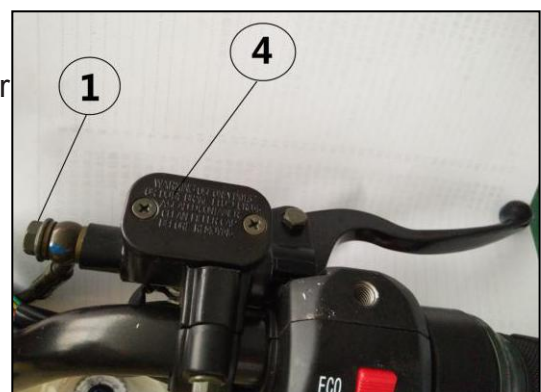
Wear suitable protective clothing and goggles.

If brake fluid gets into your eyes,rinse thoroughly with water and contact a doctor immediately.

Brake fluid can damage paint,rubber and plastic parts.When brake fluid dripping on such parts wipe it away immediately.



1. Place a container under the brake calliper.
2. Remove the banjo bolt (1) and empty the brake hose (2).
3. Remove the headlight cover.
4. Remove the banjo bolt from the master brake cylinder.
5. Replace the brake hose. Take care that the brake hose is installed correct and is connected to all brackets. Use new gaskets when you connect the brake hose.
6. Remove the cover (4) with the membrane.
7. Add brake fluid to the MAX level.
8. Open the bleed valve (5) and add a brake bleeding tool on the valve.Start to aspirate the brake fluid as long as is in the system.Take care that the brake fluid level in the master brake cylinder will not fall lower than the MIN level otherwise you suck air in the system once again.  
Suck continuously the air out of the system and add brake fluid continuously unit the system has been bled.
9. Close the vent valve and refill the brake fluid level to the MAX level.
10. Reassemble all other parts in reverse order.



## BRAKE OPERATION INSPECTION REAR

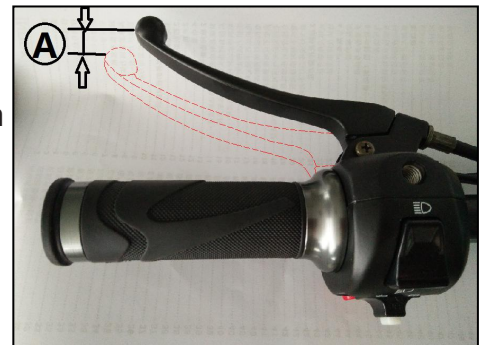
1. Operate the left hand brake lever until the brake pads lie on the brake drum and check if there is a pressure point. If there is no pressure point check the brake system.
2. While operate the rear brake lever push the vehicle forward and backward on the handlebar to check if the brake system is working. If the brake do not work correct check the brake system.
3. Final make a driving test with low speed and check if the brake system is working. If the brake do not work correct check the brake system.



## REAR BRAKE SYSTEM ADJUSTMENT

The rear brake system is operated by a steel cable. By adjusting the steel cable, the brake can be set.

1. Operate the left hand brake lever until the brake pads lie down on the brake drum. **The free play (A)** between the 0 position and the pressure point must be **10 to 20 mm**. When free play is higher or lower the brake cable need to adjusted.
2. To adjust the brake cable turn the adjustment nut (1) in or out till the free play of the brake lever is ok.



### NOTE

Please consider that the rear brake system must not block when operating. The rear brake is a support brake. The main brake system is the front brake system. The brake ration between front brake and rear brake is 80:20.

If you can not adjust the free play correct check the brake pads and the brake cable for wear.

## BRAKE CABLE REPLACEMENT

### NOTE

When the brake cable is worn or broken replace it.

1. For an easy replacement of the brake cable you must remove the front handlebar cover (2), front middle cover (3) and the leg protection panel/floor panel (4).
2. Release the adjustment nut (1) and move the cable forward.
3. Release it from the left brake lever.
4. Before you install the replacement cable grease it with multi purpose lubricant.
5. Install the replacement cable in reversed order. Take care that also the tension spring (5) between the stop and the linkage (6) is installed correct and the cable is placed in all brackets.
6. Adjust the brake cable and install the cover parts.



## FRONT FORK OPERATION INSPECTION

At every inspection the fork should be controlled.

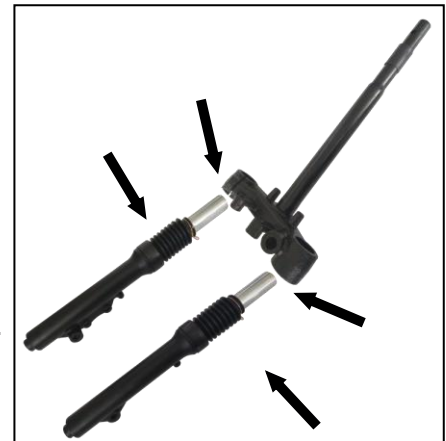
1. Apply the front brake and compress the front shock absorber up and down to check for correct operation.
2. When the fork stick, feel spongy or the free play between the fork tubes is too big replace the defect fork leg.
3. Check if each screw is tightened.



## FRONT FORK OIL LEAK INSPECTION

At every inspection check also if the fork is tight.

1. Check the dust/ oil seal between the fork legs and the top end. When oil is leaking replace the affected fork leg.



## REAR SHOCK OPERATION INSPECTION

At every inspection the rear shock absorber should be controlled.

1. Compress the rear shock absorber up and down to check for correct function.
2. Check whether a part of the rear shock absorber is damaged or loosened.
3. Put the vehicle on the main stand and move the rear wheel up down and left right to check whether any bush or bearing is loosened or has abnormal free play.
4. When the absorber stick, feel spongy or there is any other abnormality replace it.
5. Check if each screw is tightened.



### NOTE

The rear shock absorber is spring loaded. The spring preload can be adjusted with the locknut in five positions. Choose the preferred setting by your self. The factory setting refers to a rider weight of approximately 75 kg.

## REAR SHOCK OIL LEAK INSPECTION

At every inspection the rear shock absorber should be controlled.

1. Check the dust/ oil seal and check if the spring is in correct condition. When oil is leaking, the spring is cracked or worn replace the shock absorber.





This model is equipped with a sealed type (MF) battery, which does not require any maintenance. There is no need to check the electrolyte or to add distilled water.

## **⚠WARNING**

- Do not remove the battery, this can be dangerous, the battery permanently damaged. If a battery do not work correct, have a dealer to check it.
- If the battery is not full after charging for over 24 hours, please stop charging and contact the after-sales service.
- To maximize the battery life, users are advised to keep the battery percentage within the range of 20% to 80% as practicably as possible. Please use the accelerator handlebar gently in a normal ride.
- Do not keep the battery at an ambient temperature over 40°C so as to prevent irreversible capacity loss of the battery.
- At low temperatures, the lithium battery capacity will lose at varying degrees. To be more specific, the usable capacity at -10°C is 70%, that at 0°C 85% and that at 25°C 100%.
- The best battery capacity for storage is 80%. Storage of battery less than 10% full or more than 90% full over a long period of time will cause irreversible capacity loss of the battery.
- For storage over a long period of time, please keep the battery at an ambient temperature from -20°C to 40°C, and have a charge and a discharge at least once a month so as to minimize battery capacity loss in storage.
- Do not keep the battery in places with the risk of falling. That's because falling may cause uncontrollable internal damage to the battery and may lead to leakage, overheat, smoking, fire or explosion.

## LIGHT AND SWITCHES OPERATION INSPECTION

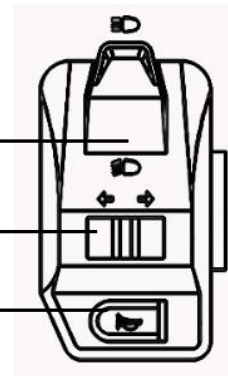
1. Place the vehicle on the main stand and start the engine.

Some functions do not work as long the engine is not running.

2. Now you can test one by one the functions of all switches, the function of the rear and front light and the brake light.

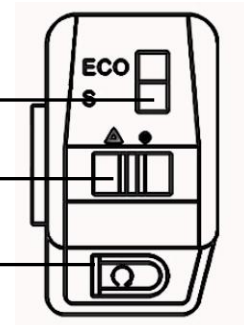
### Switches/ Functions - left side

1. High/ Low beam switch
2. Indicator switch
3. Horn switch



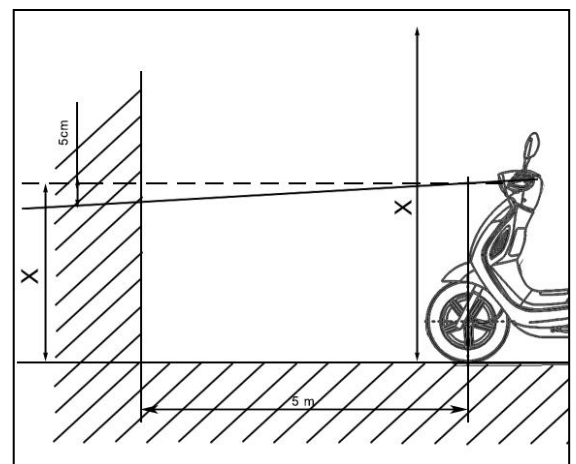
### Switches/ Functions - right side

4. Gear Change
5. Double Flash Switch
6. Start Button



## HEADLIGHT AIMING INSPECTION

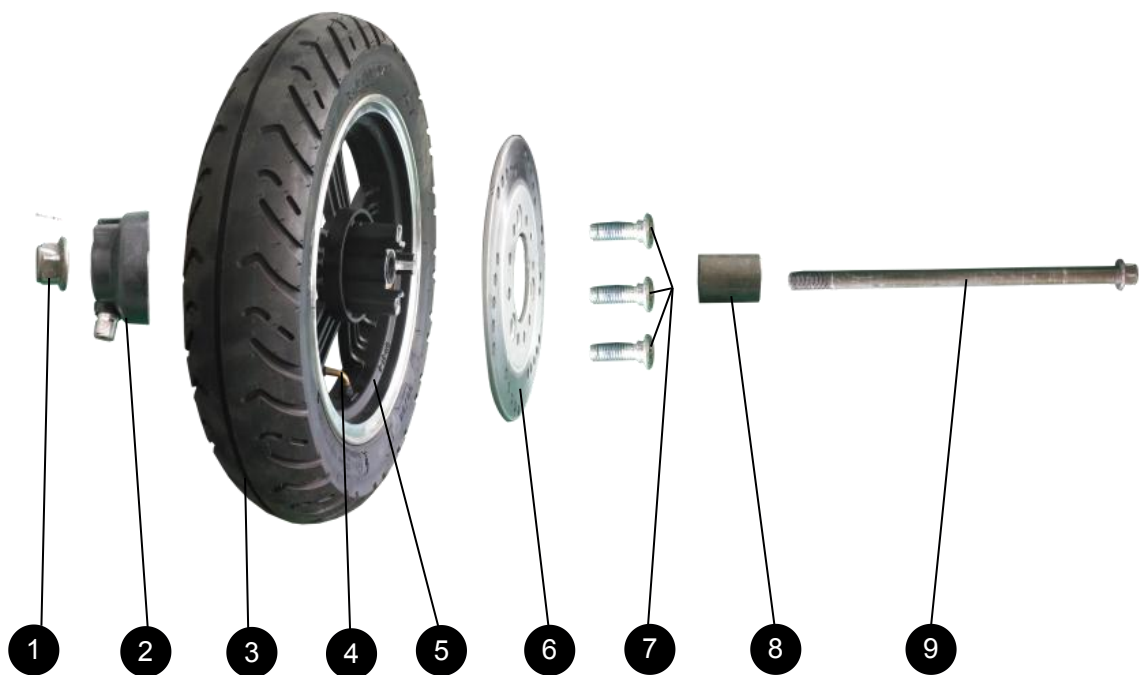
7. Place the vehicle at a distance of 5 meters in front of a wall. The vehicle must be placed horizontally.
8. Measure the distance from the ground to the middle of the headlight bulb (X).
9. Transfer this value to the wall and mark it with an X.
10. Then make a second X 5 centimeter below the first X.



## **5. REPAIR AND DIAGNOSTICS**



## EXPLODED VIEW/ PART LOCATION - FRONT WHEEL



### PART LIST - FRONT WHEEL

1. Nut M12×1.25

2. Speedometer drive

3. Tyre

4. Tyre valve

5. Rim
6. Disc

7. Bolts for disc

8. Spacer short

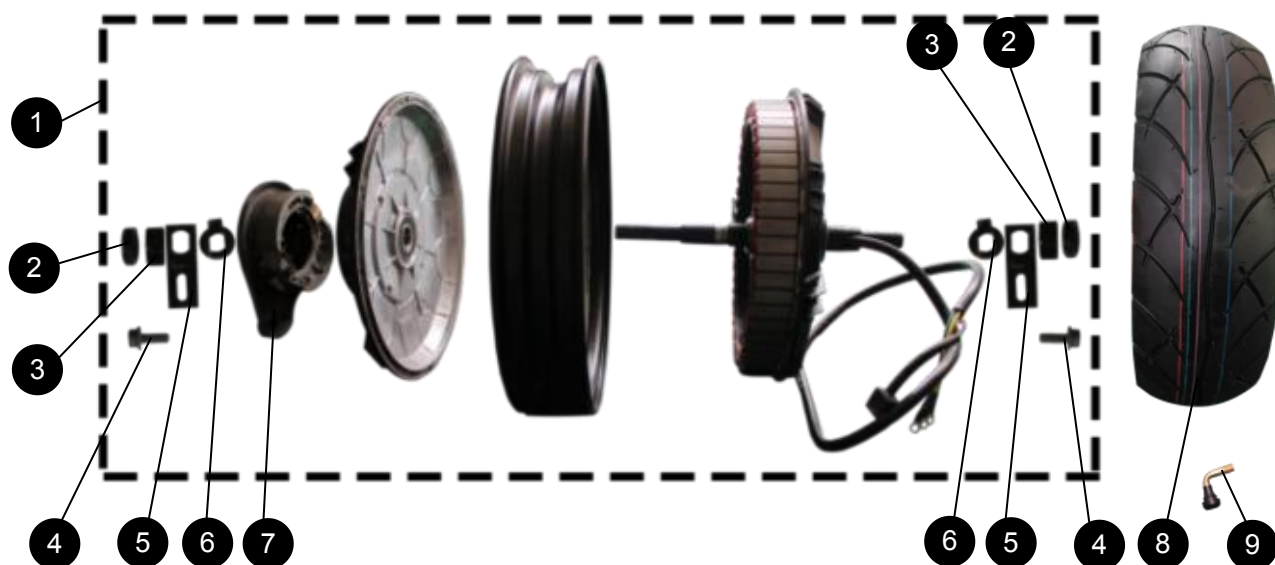
9. Front Axle

### TORQUE LIST

PART NO.	TORQUE
1,9	68-85Nm

For screws that are not listed use standard values (page 8).

## EXPLODED VIEW/ PART LOCATION - REAR WHEEL



### PART LIST - REAR WHEEL

- |                        |                             |
|------------------------|-----------------------------|
| 1. Motor with rear rim | 5. Holder                   |
| 2. Nut M16×1.5—8       | 6. Rear brake assy complete |
| 3. Nut M16×1.5—12      | 7. Tyre                     |
| 4. Bolt M6×16          | 8. Tyre valve               |
| 5. Bracket             |                             |

### TORQUE LIST

PART NO.	TORQUE
1	100-113Nm

For screws that are not listed use standard values (page 10).

### SPECIFICATION - FRONT/ REAR WHEEL

PART NO.	TORQUE	PRESSURE [BAR]	MINIMUM TREAD DEPTH
Front tire	90/90-12	2.0 ± 0.1	technically - 1,6 mm legal value may be different
Front rim	MT2.15×12		
Rear tire	120/70-12	2.0 ± 0.1	technically - 1,6 mm legal value may be different
Rear rim	J12×2.15		

### TROUBLESHOOTING - FRONT/ REAR WHEEL

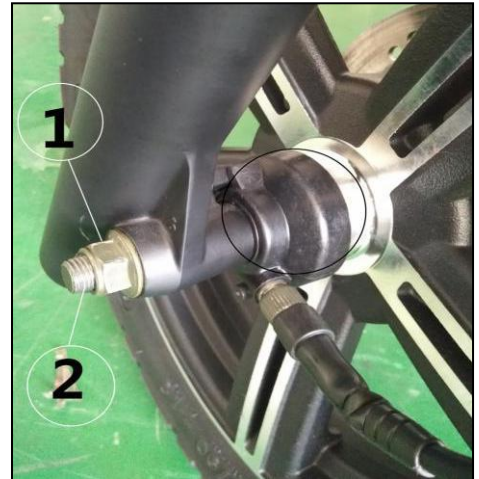
FAILURE	CAUSE	TO DO
It's hard to move the wheels	One wheel bearing is damaged	Replace the bearing
	The tire air pressure is to low	Adjust the air pressure
Wheel unbalanced	Rim damaged	Replace the rim
	Tire worn	Replace the tire or Balance the wheel
Abnormal or scratching noise	Wheel bearing loosened or worn	Replace the bearing
	Speedometer drive defect	Replace the speedometer drive

## FRONT WHEEL REPLACEMENT

1. Place an appropriate supporting stand under the engine  
In order to raise the front wheel up.
2. Remove the nut (1) to pull out the axle (2).
3. Remove the front wheel.
4. Reassemble in reverse order.

### NOTE

Control the correct position of the speedometer drive (circle).



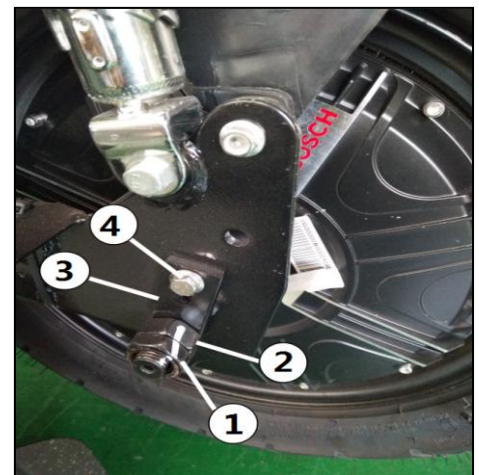
## REAR WHEEL REPLACEMENT

Left side

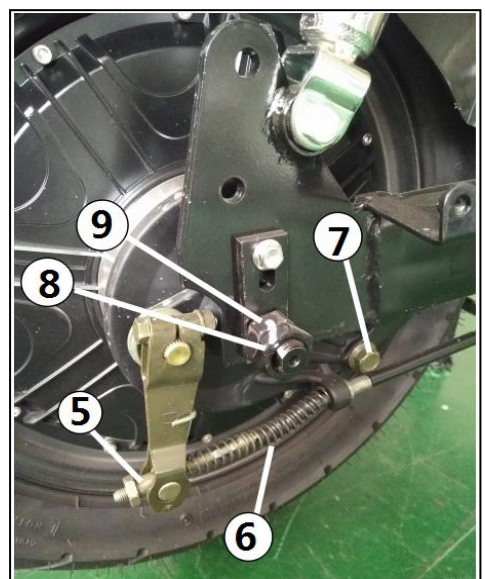
1. Remove the swinging arm cover left.
2. Remove the fixing nut (1) and the nut (2).
3. Remove the bolt (3) and the adjustment bracket (4).

Right side

4. Remove the swinging arm cover right.



5. Remove the rear brake adjustment nut (5) and thread out the brake cable (6).
6. Remove the nut (7) and the bolt
7. Remove the fixing (8) nut and the nut (9).
8. Pull out the rear wheel.
9. Reassemble in reverse order.



## WHEELS (RIMS)

The wheel rims should be checked for cracks, bends. If any damage is found replace the rim. Do not attempt even the smallest repair of the wheel. The wheel should be balanced whenever either the tire or the rim has been changed or replaced. An unbalanced wheel can result in poor performance, adverse handling characters, and a shortened tire life.

## TIRES

The tires must be checked during each workshop visit. If a tire tread shows crosswise lines (minimum tread depth), the tire has a fragments in it, the sidewall is cracked then replace the tire immediately. Operating the Motorcycle with excessively worn tires will decrease the riding stability and can lead to loss of control. Please replace the excessive worn tires immediately.

### NOTE

**Allowable tread limit X : Technically - 1,6 mm**  
**Legal value may be different!**



## WHEEL BEARING WHEEL AXLE DAMAGE INSPECTION

The wheels rotate with difficulties .The wheel-axle Bearing or the gear seats are in failure.To find the error, the wheel must be removed.

1. Loose the mounting bolt (1) of the braking cylinder.  
Remove components (2) of the braking cylinder.
2. Place an appropriate supporting stand under the engine in order to raise the front wheel up.
3. Loose the mounting bolt (3) which fixing the axle of the front wheel in order to remove the front wheel and its axle.
4. Remove the speedometer gear seat.
5. Remove axle sheath,oil seal,axle (6200-2RS), axle insulating sheath axle (6200-2RS).
6. Reassemble in reverse order.



## FRONT WHEEL BEARING INSPECTION

1. Examine the rolling condition of the bearing.
2. If it doesn't roll, or the bearing is damaged or loosened, It should be replaced.

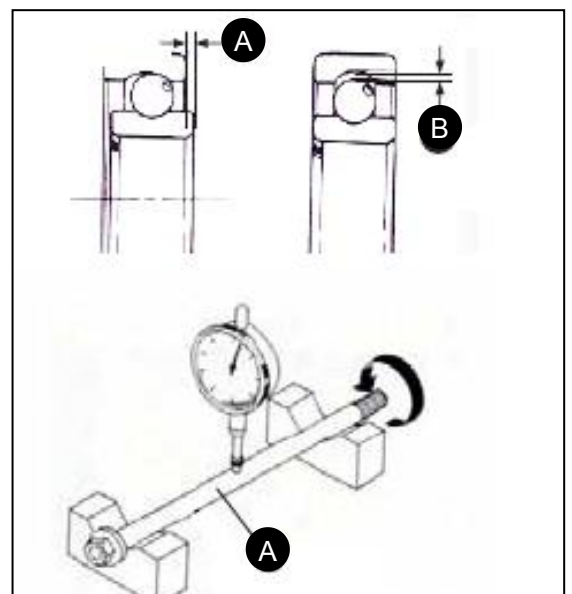
**Allowable limit (A): 2 mm**

**Allowable limit (B): 2 mm**

## INSPECT BENDING OF THE WHEEL SPINDLE

1. Put to wheel axle on a V-shape seat and use dial Indicator to measure its eccentricity.

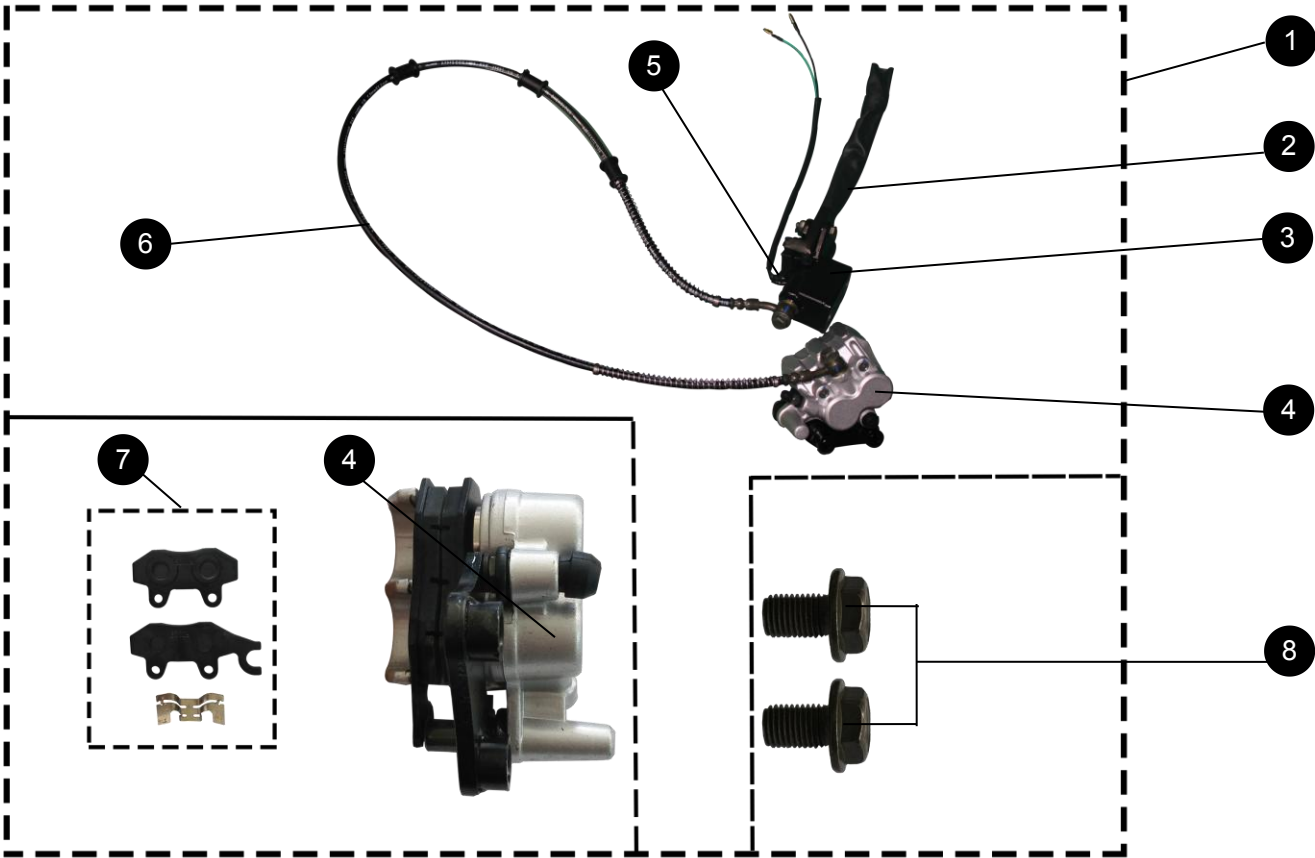
**Allowable limit (A): 2 mm**



PART LOCATION - FRONT BRAKE

⚠WARNING

THE BRAKING COMPONENTS MAY NOT BE SPOIL BY OIL DURING INSTALLATION OR DISASSEMBLY.  
 RINSE WITH STIPULATED CLEANING AGENT IN ORDER TO AVOID REDUCTION OF BRAKING QUALITY.



PART LIST - FRONT BRAKE

- |                              |                     |
|------------------------------|---------------------|
| 1. Front brake assy complete | 5. Brake switch     |
| 2. Brake lever               | 6. Brake cable      |
| 3. Brake fluid reservoir     | 7. Brake pads       |
| 4. Brake calliper            | 8. Bolt M10×1.25×25 |

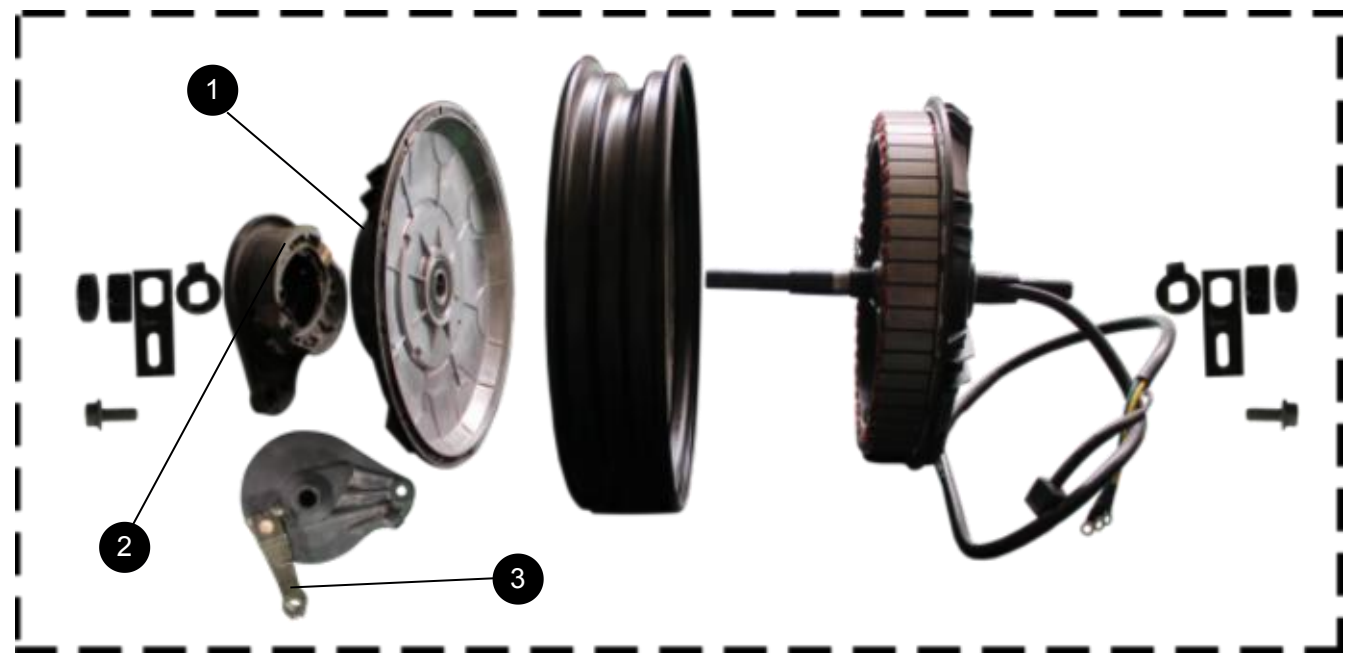
TORQUE LIST

PART NO.	TORQUE
8	40-50Nm

For screws that are not listed use standard values (page 8).



EXPLODED VIEW/ PART LOCATION - REAR BRAKE



PART LIST - REAR WHEEL

1. Rear brake drum
2. Brake pads
3. Brake arm

TORQUE LIST

PART NO.	TORQUE
2,3	22-29Nm

For screws that are not listed use standard values (page 8).

SPECIFICATION - FRONT/ REAR BRAKE

ITEM	STANDARD VALUE [mm]	ALLOWABLE LIMIT [mm]
Thickness of front brake disc	3.5	3.0
Thickness of front brake pads	7.0	6.0
Diameter of front brake disc	180	—
Bore of rear brake drum	110	—
Thickness of rear brake drum	4.0	3.0

## SPECIAL TOOLS

See page 11 - 13

## TROUBLESHOOTING - FRONT/ REAR BRAKE

FAILURE	CAUSE	TO DO
Poor brake performance	Unfavourable brake adjustment	Adjust the brake system
	Brake pads worn	Replace the brake pads
	Brake pads installed improperly	Install the brake pads proper
	Brake pads or brake disc contaminated	Clean or replace the brake pads and clean the brake disc/ drum
	Air in the front brake hose	Bleed the brake hose
	Gasket(s) leaky	Replace affected gasket
Strange sound during braking	Brake pads glazed	Replace the brake pads
	Burrs	Grind away burr
	Brake pads or brake disc contaminated	Clean or replace the brake pads and clean the brake disc/ drum
Pulsing during braking	Brake disc worn	Replace brake disc
	Brake drum worn	Replace the rear rim

## FRONT BRAKE LEVER

The front brake lever is located on the right side of the handlebar.

### NOTE

This lever operated by hydraulic the front brake. It is not Possible to adjust the free-play of the front brake lever. When the brake lever feels spongy or the brake performance

is poor the front brake system have to be bled.

See page 31.



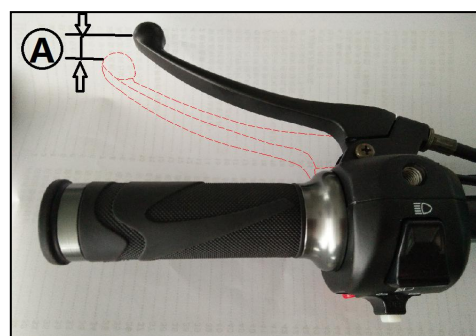
## REAR BRAKE LEVER

The rear brake lever is located on the left side of the handlebar.

### NOTE

This lever operated by steel cable the rear brake. When the brake lever feels spongy, the brake performance is poor or the free play (X) is not correct the rear brake system have to be adjusted. See page 32.

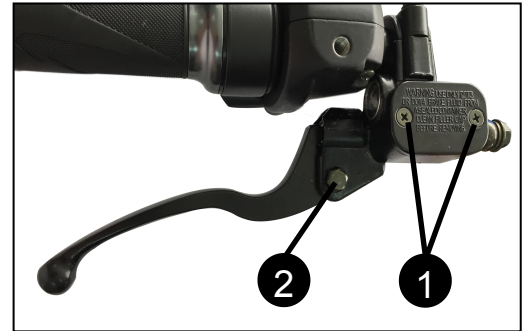
**Allowable limit (X): 10-20 mm**



## FRONT BRAKE LEVER/ MASTER BRAKE CYLINDER REPLACEMENT

When the performance of the front brake is poor it could be possible that the plunger module gaskets are defect.

1. Remove the handlebar covers.
2. Drain the brake fluid from the hydraulic brake system.
3. Remove the two bolts attaching the brake master cylinder (1).
4. Remove the brake master cylinder.
5. Remove the brake lever bolt (2) and the brake lever.
6. Replace defect parts and assemble in reversed order.
7. Refill the brake system.



### NOTE

The plunger module is not available separately.

## FRONT BRAKE CALLIPER REPLACEMENT

When the performance of the front brake is poor it could be possible that the gaskets of the front brake calliper defect or the brake pads are worn.

1. Drain the brake fluid the hydraulic brake system.
2. Remove the banjo bolt (1) from the master brake cylinder.
3. Remove the two bolts (2) attaching the brake calliper.
4. Replace the brake calliper.
5. Reassemble in reverse order.
6. Refill the brake system.

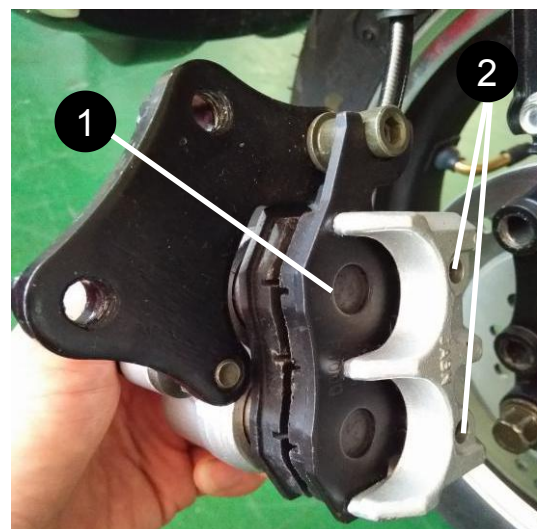


## FRONT BRAKE PADS REPLACEMENT

1. Remove the two bolts (2) attaching the brake calliper.
2. Remove the two bolts to remove the brake pads (1) .

### NOTE

- Replace the brake pads always in pair.
3. Reassemble in reverse order.





## BRAKE PAD WEAR INSPECTION

Reduced braking efficiency caused by worn brake pads.

Change worn brake pads immediately. Always replace the brake pads in pair.

Front: See page:29

Rear: See page: 30

## BRAKE DISC INSPECTION

Check the thickness of the front disc (1) at several places on the Disc to see if it confirms to measurement.

See page: 30

## BRAKE DRUM INSPECTION

Check the inner diameter of the brake drum (1) at several places on the drum to see if it confirms to measurement.

See page: 31

## BRAKE FLUID

### ⚠ WARNING

1. Never use dirty or unspecified brake fluid or mix different Brake fluid because it will damage the brake system.
2. Brake fluid spilled on brake pads or brake disk will reduce the braking effect. Clean the brake pads and brake disk with a high quality brake degreaser.
3. When servicing the brake system, use shop towels to cover plastic parts and coated surfaces to avoid damage caused by splash of brake fluid.
4. Do not allow dust or water to enter the brake system during refilling.
5. Brake fluid should be replaced at least every 2 years.

## SPECIFICATION - FRONT BRAKE

Brake fluid type	CASTROL SUPER DISK BRAK E FLUID DOT 4
Brake fluid boiling temperature	> 170 °C
Brake fluid water content	<3%

## BRAKE HOSE

1. When the front brake hose is leaking, cracked or worn you must replace it.

### NOTE

Please consider that there is no need to remove the brake calliper when you need to replace the brake hose.

2. When the brake hose need to be replaced use only genuine parts.
3. For brake hose replacement see page 31.

## BRAKE CABLE

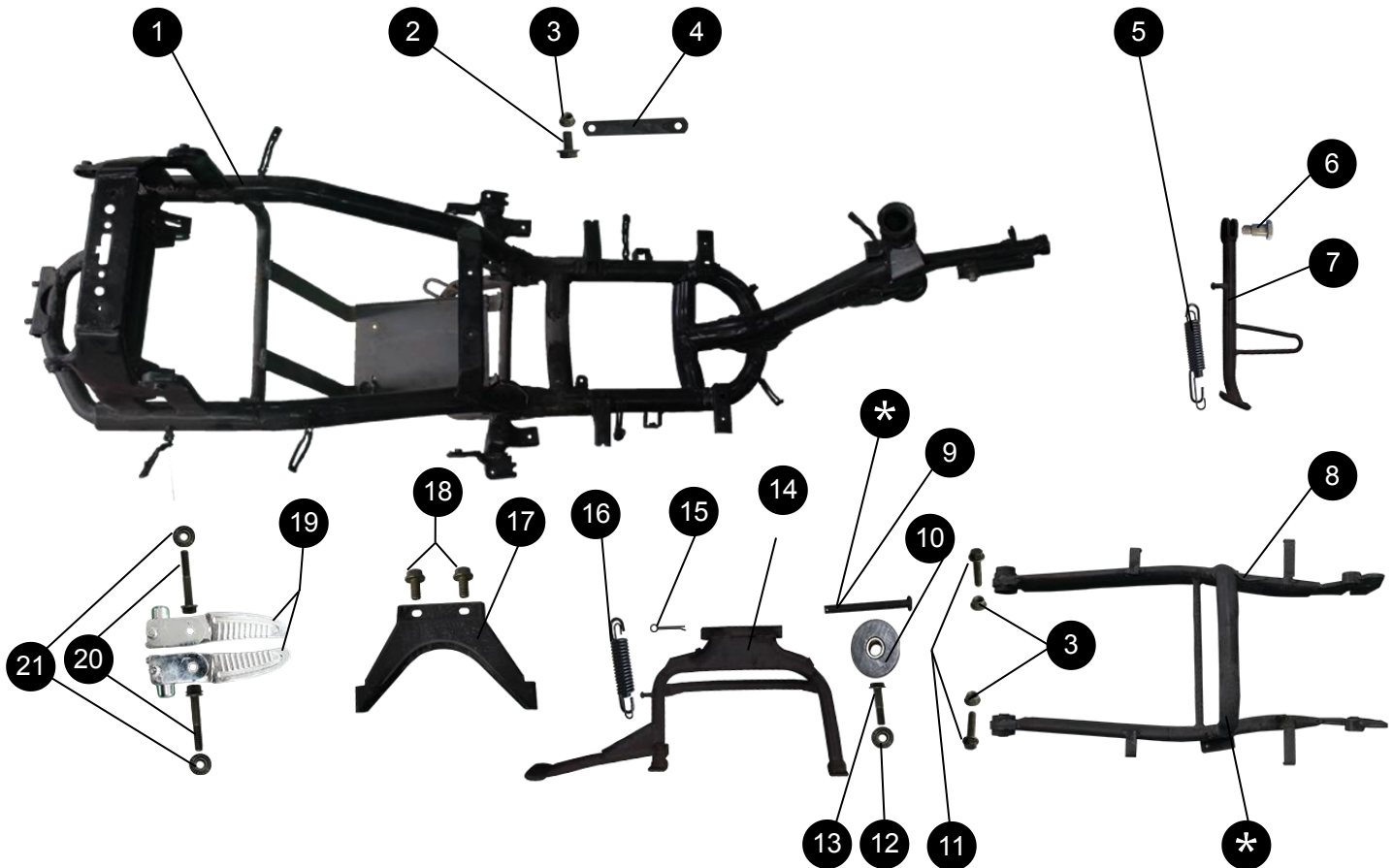
1. When the rear brake cable is cracked or worn you must replace it.

### NOTE

Please consider that there is no need to remove the rear wheel when you need to replace the brake cable.

2. When the brake cable need to be replaced use only genuine parts.
3. For brake cable replacement see page 32.

## EXPLODED VIEW/ PARTS LOCATION - CHASSIS



## PART LIST - CHASSIS

1. Frame
2. Bolt M10×25
3. Nut M10
4. Rear brake rod
5. Spring side stand
6. Bolt of side stand
7. Side stand
8. Rear fork
9. Pin roll of central stand
10. Rubber buffer
11. Bolt M10×55
12. Nut M6
13. Bolt M16×30
14. Central stand
15. Pin of central stand
16. Spring central stand

## TORQUE LIST

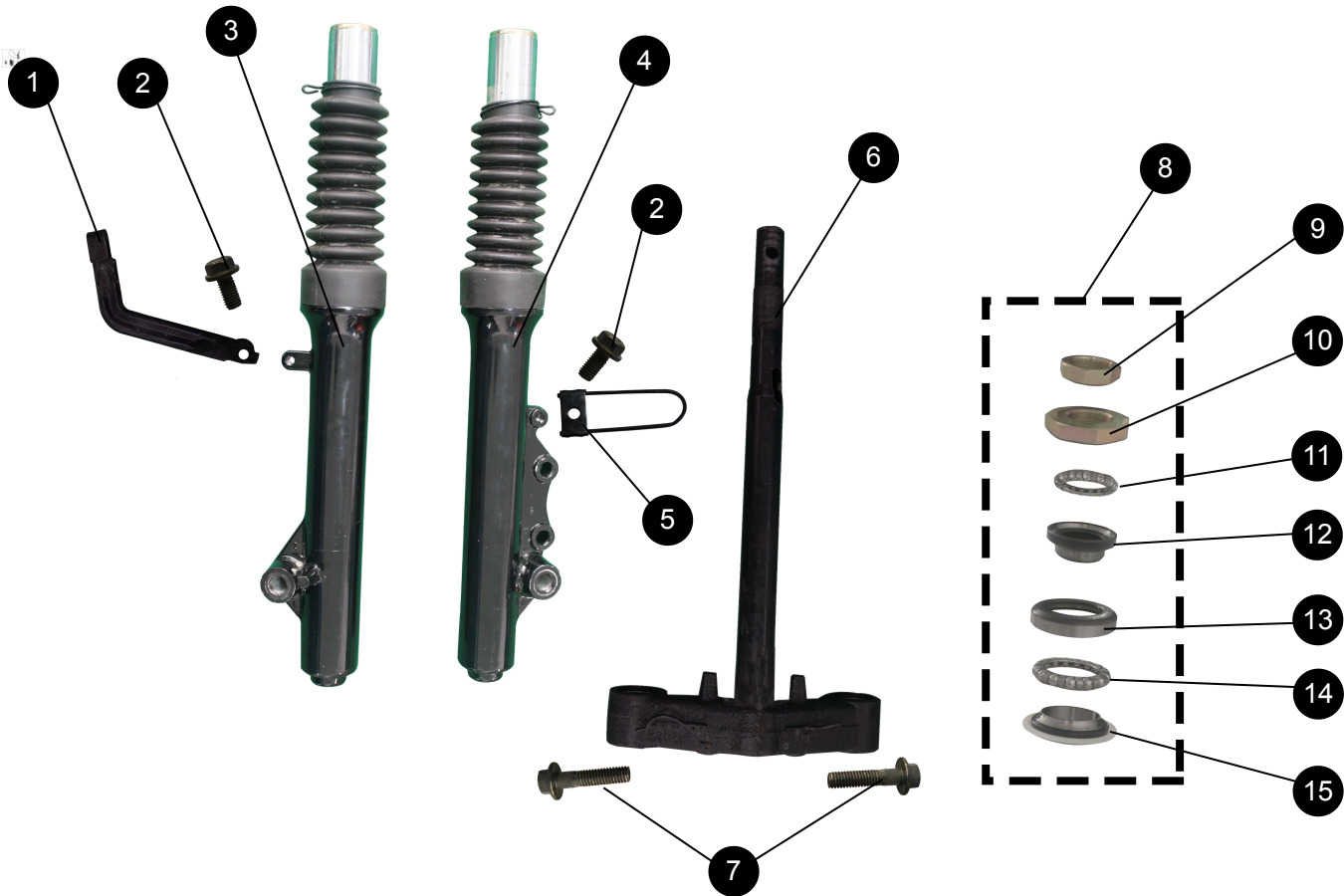
PART NO.	TORQUE
3,11	40-45Nm

17. Bracket between frame and rear cover
18. Bolt M18×12
19. Footrest
20. Bolt M6×35
21. Nut M6

### NOTE

Component and connections marked with “\*” should be controlled and lubricated during each workshop visit of the vehicle. Use multipurpose grease for lubrication.

EXPLODED VIEW/ PART LOCATION - FRONT SUSPENSION



PART LIST - REAR WHEEL

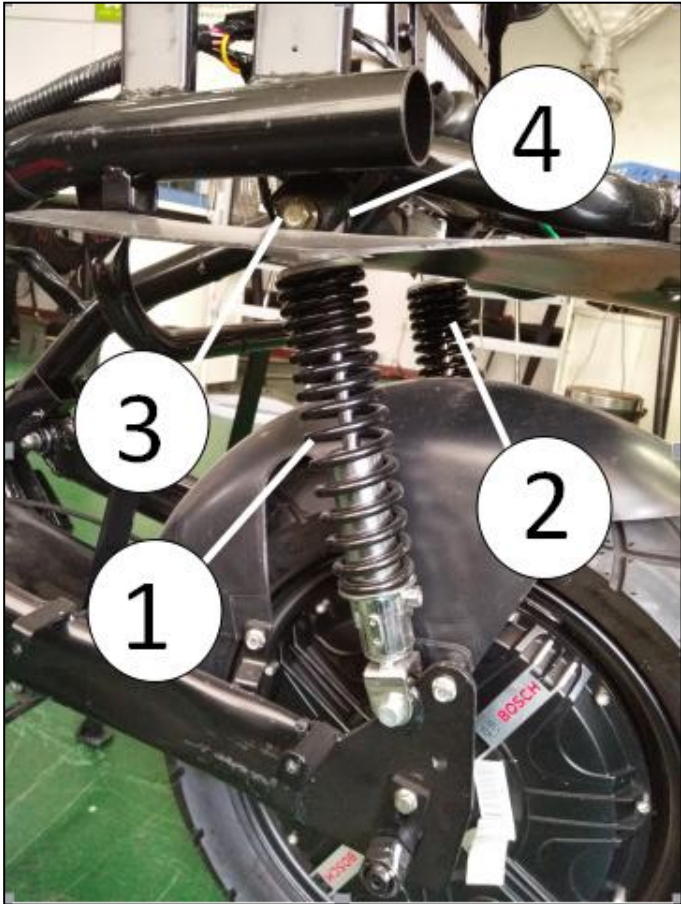
- 1. Brake hose cable bracket
- 2. Bolt M6×12
- 3. Left fork leg
- 4. Right fork leg
- 5. Speedometer cable bracket
- 6. Fork shaft with triple tree
- 7. Bolt M12×40
- 8. Bearing fork assy
- 9. Fixing nut
- 10. Upper Bearing race-above  
(Adjustment nut)

TORQUE LIST

PART NO.	TORQUE
7	55-62Nm

- 11. Bearing set - above
- 12. Lower bearing race - above
- 13. Upper Bearing race - below
- 14. Bearing set - below
- 15. Lower bearing race - below

EXPLODED VIEW/ PART LOCATION - REAR SUSPENSION



PART LIST - REAR SUSPENSION

- 1. Left shock absorber
- 2. Right shock absorber
- 3. Bolt M10×1.25×40 ( only left side illustrated )
- 4. Nut M10 ( only left side is illustrated )

SPECIFICATION

ITEM	DESCRIPTION	VALUE
Rear shock absorber	Adjustable, spring loaded telescope unit (cartridge)	45mm max, travel

TORQUE LIST

PART NO.	TORQUE
NO.3/4	37-44Nm

## SPECIAL TOOLS

There are no special tools recommended because defect suspension elements may not be disassembled. Always's replace defect suspension elements.

## TROUBLESHOOTING

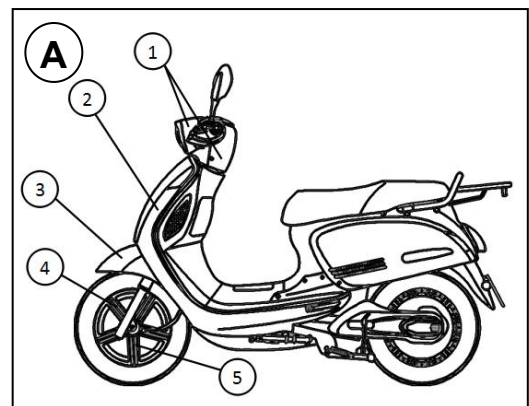
FAILURE	CAUSE	TO DO
Vehicle difficult to steer	Insufficient tire pressure	Adjust the tire pressure
	Broken or bent fork leg	Replace the affected fork leg
	Uneven front shock absorbers	Control and adjust or replace affected fork leg
Soft front shock absorber	Weak shock spring	Replace the affected fork leg
	Insufficient damper oil	Replace the affected fork leg
Front shock absorber noise	Broken or bent fork leg	Replace the affected fork leg
	Loose fork fasteners	Tighten the fasteners
	Lack of lubrication	Replace the affected fork leg
Leaking fork leg	Gasket defect	Replace the affected fork leg
Weak rear shock absorber spring	Spring worn or broken	Replace the rear shock absorber
Leaking rear shock absorber	Gasket defect	Replace the rear shock absorber

### NOTE

Before each repair of a defect suspension element consider the max.cross weight of the vehicle.

## FRONT SUSPENSION REPLACEMENT

1. Place an appropriate supporting stand under the engine in order to raise the front wheel up.
2. Remove the front and rear handlebar cover (1), the front middle cover (2), the front mudguard (3), the front wheel (4) and the front brake calliper (5).



### NOTE

1. When you replace parts 1 and 2 it is recommended to disconnect all electric wires.
2. When you replace the front brake calliper you must Release the brake hose from the triple tree but it is not recommended to disconnect the brake hose from the front brake calliper or the master brake cylinder.
3. Remove the bolt (6), which connects the handlebar and the fork shaft.





4. Lift the handle bar up (arrow) and away.
5. Remove the fixing nut (7) and remove the adjustment nut.
6. Remove the bearing components. Details see chapter steering.

7. Remove the front fork.
8. Reassemble in reverse order.

## NOTE

Before the assembling grease the bearing race and the front axle.

## FRONT SUSPENSION FORK LEG REPLACEMENT

1. Place an appropriate supporting stand under the engine in order to raise the front wheel up.
2. Remove the front middle cover (2), the front mudguard (3), the front wheel (4) and the front brake calliper as shown in the picture (A) on the side before.

## NOTE

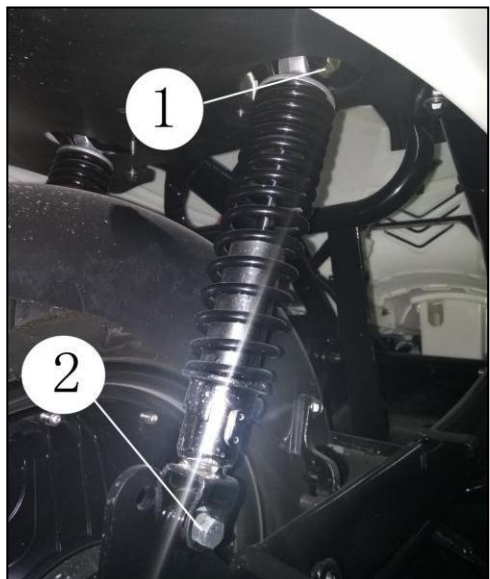
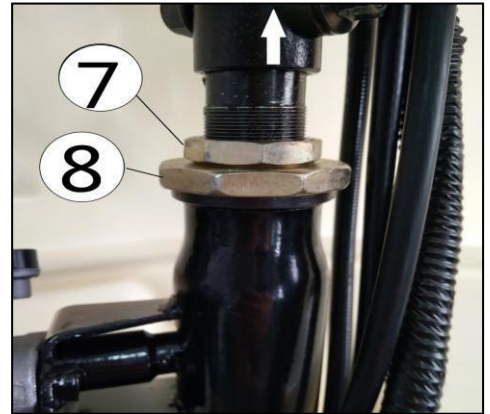
1. When you replace parts 1 and 2 it is recommended to disconnect all electric wires.
2. When you replace the front brake calliper you must Release the brake hose from the triple tree but it is not recommended to disconnect the brake hose from the front brake calliper or the master brake cylinder.
3. Remove the required bolt (6) and replace defect fork leg.
4. Reassemble in reverse order.

## REAR SUSPENSION REPLACEMENT

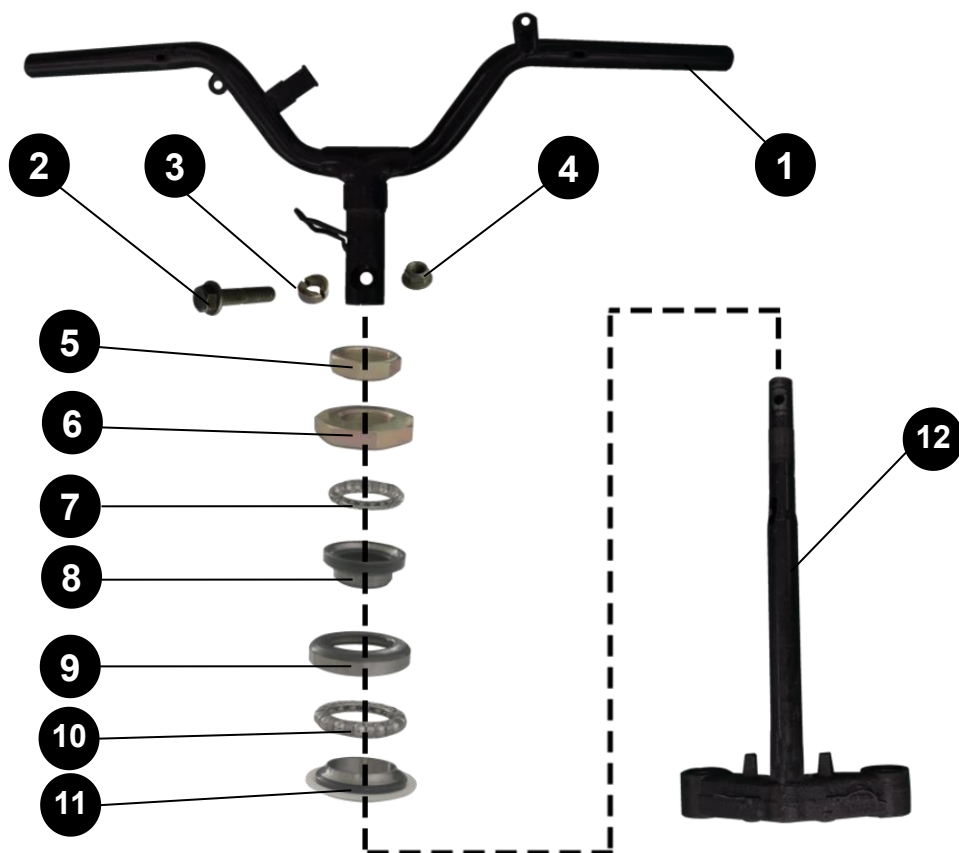
1. Place an appropriate supporting stand under the engine in order to raise the rear wheel up.
2. Remove the upper bolt M10×40 (1) and the lower bolt M8×1.25×35 (2)
3. Reassemble in reverse order.

## NOTE

Only one side (left side) is illustrated



## EXPLODED VIEW - PART LOCATION / STEERING



### PART LIST FRONT- STEERING

- |                |   |                                 |
|----------------|---|---------------------------------|
| 1. Handlebar   | 6. Upper Bearing race - above(Adjustment nut) | 10. Bearing set - below         |
| 2. Bolt M10×45 | 7. Bearing set - above                        | 11. Lower bearing race - below  |
| 3. Bush        | 8. Lower bearing race - above                 | 12. Fork shaft with triple tree |
| 4. Nut M10     | 9. Upper Bearing race - below                 |                                 |
| 5. Fixing nut  |   |                                 |

### TORQUE LIST

PART NO.	TORQUE
2,5	40-60Nm

### TROUBLESHOOTING

FAILURE	CAUSE	TO DO
Vehicle difficult to steer	Steering bearing loose	Retighten the bearing
	Steering bearing worn	Replace the steering components
	Bearing balls lost or broken	Replace the steering components



## STEERING REPLACEMENT

1. Place an appropriate supporting stand under the engine in order to raise the front wheel up.
2. Remove the front and rear handlebar cover (1), the front middle cover (2), the front mudguard (3), the front wheel (4) and the front brake calliper (5).

### NOTE

1. When you replace parts 1 and 2 it is recommended to disconnect all electric wires.
2. When you replace the front brake calliper you must Release the brake hose from the triple tree but it is not recommended to disconnect the brake hose from the front brake calliper or the master brake cylinder.
3. Remove the bolt (6), which connects the handlebar and the fork shaft.
4. Lift the handle bar up and away.
5. Remove the pinched nut (7), the adjustment nut and the steering bearing components.

### △WARNING

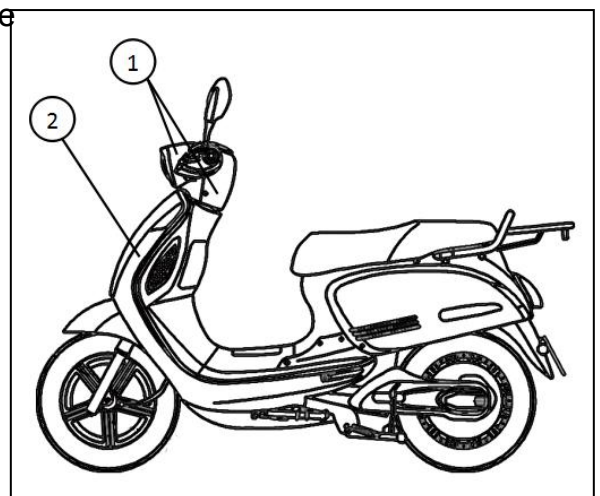
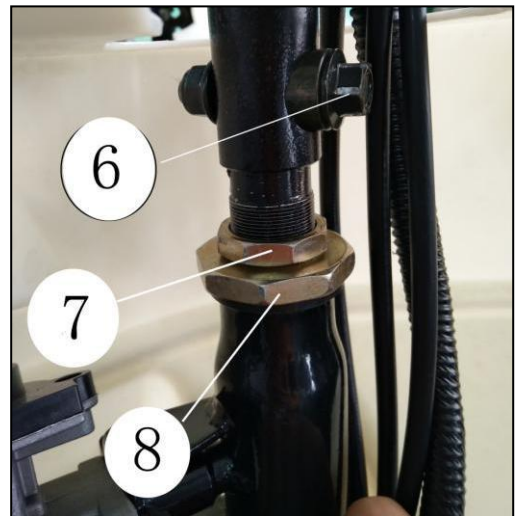
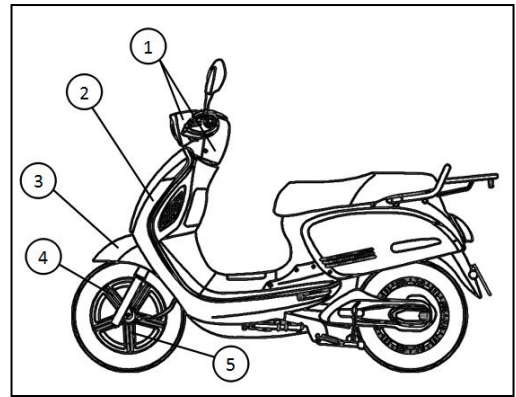
6. Remove the front fork.
7. Replace the lower bearing components (see page 42).
8. Assemble the front fork.
9. Assemble the upper bearing components (see page 42).
10. Reassemble in reverse order. Tighten the adjustment nut carefully, that the steering have no free play but still is turnable. Tighten the fixing nut with a wrench (32mm).
11. Reassemble other parts in reverse order.

### NOTE

Before the assembling, grease the bearing race and the front axle.

## HANDLE BAR REPLACEMENT

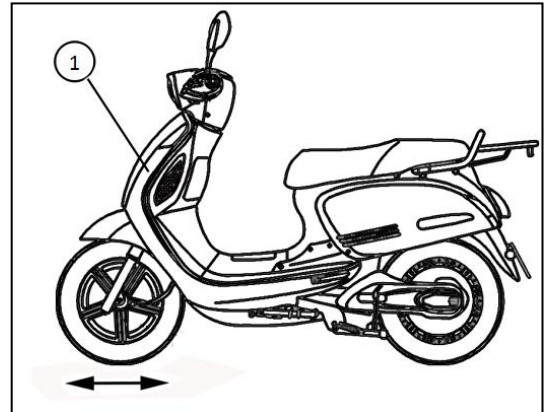
1. Place an appropriate supporting stand under the engine in order to raise the front wheel up.
2. Remove the front, rear handlebar cover (1) and the front middle cover (2).
3. Remove all parts from the handlebar and install it on the new one.
4. Remove the bolt (6), which connects the handlebar and the fork shaft.
5. Lift the handle bar up and away.
6. Reassemble the other parts in reverse order.



## STEERING PLAY INSPECTION

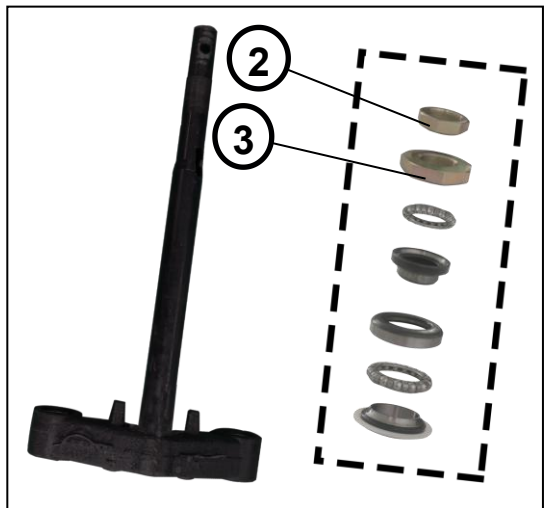
Worn or loose steering bearings may cause danger. Therefore, the operation of the steering must be checked as follows at the intervals specified in the Periodic maintenance and lubrication chart.

1. Place a stand under the vehicle to raise the front wheel off the ground.
2. Hold the lower ends of the front fork legs and try to move them forward and backward.
3. If any free play can be felt, adjust or replace the steering bearing.



## STEERING PLAY ADJUSTMENT

1. Place the vehicle with the front wheel on the ground.
2. Replace the front middle body cover (1).
3. Release the fixation nut (2).
4. Tighten or loosen the adjustment nut (3) till the correct setting is reached.
5. Test the steering play.



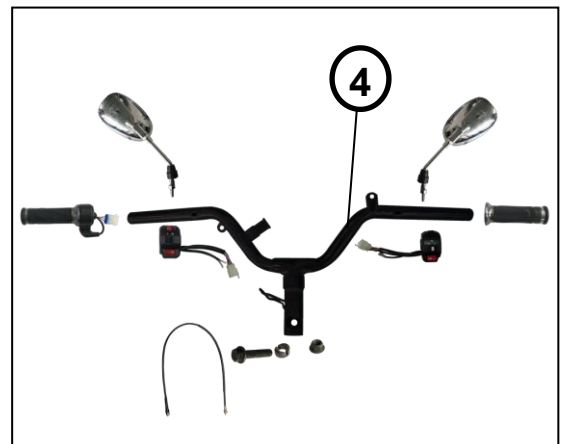
### ⚠WARNING

The steering must be adjusted in that way, that it is easy to move the handlebar and the steering is without free play.

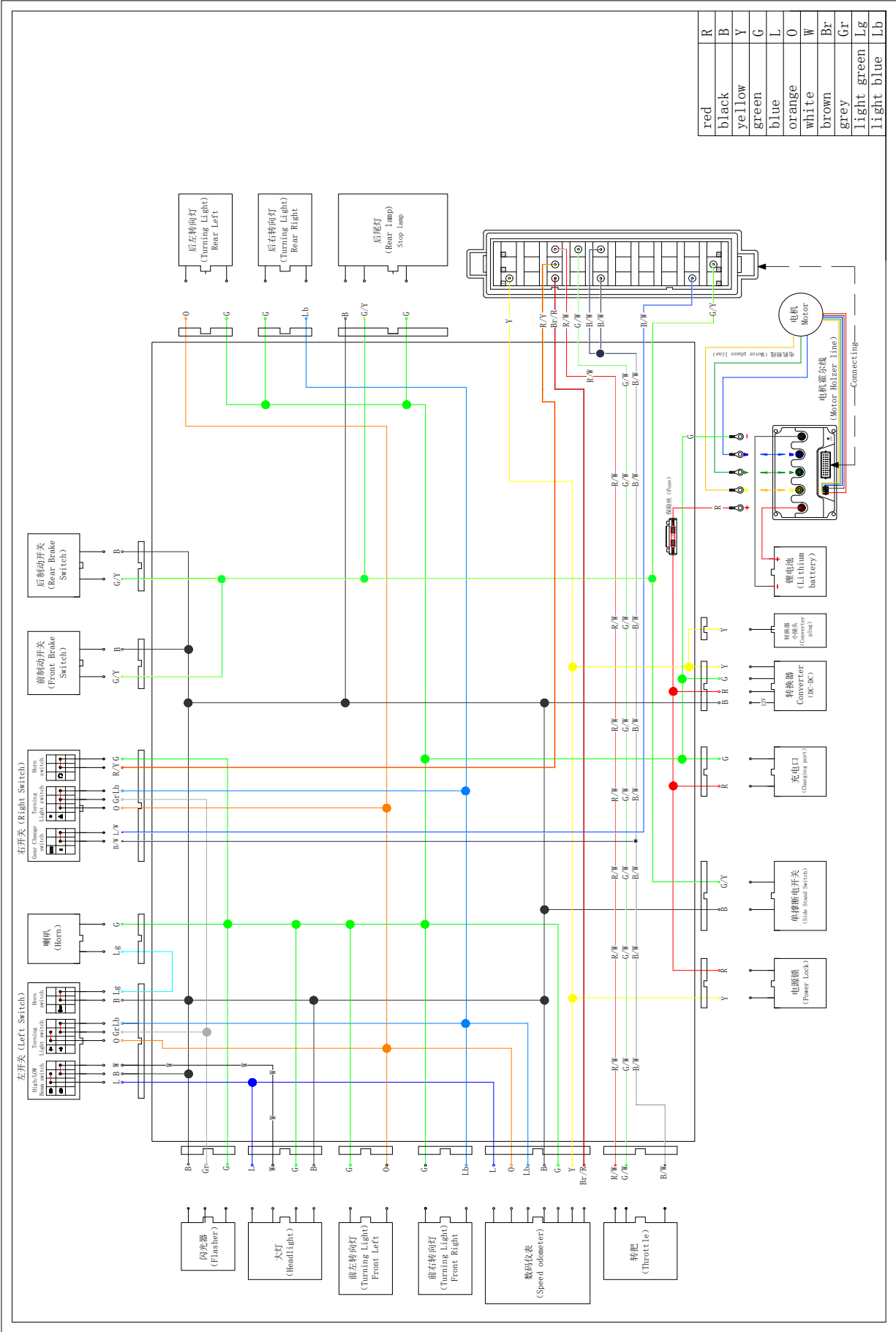
6. Finally keep the adjustment nut with a wrench in position and tighten the fixation nut.
7. Test the steering play once again.

## STEERING BEARING LUBRICATION

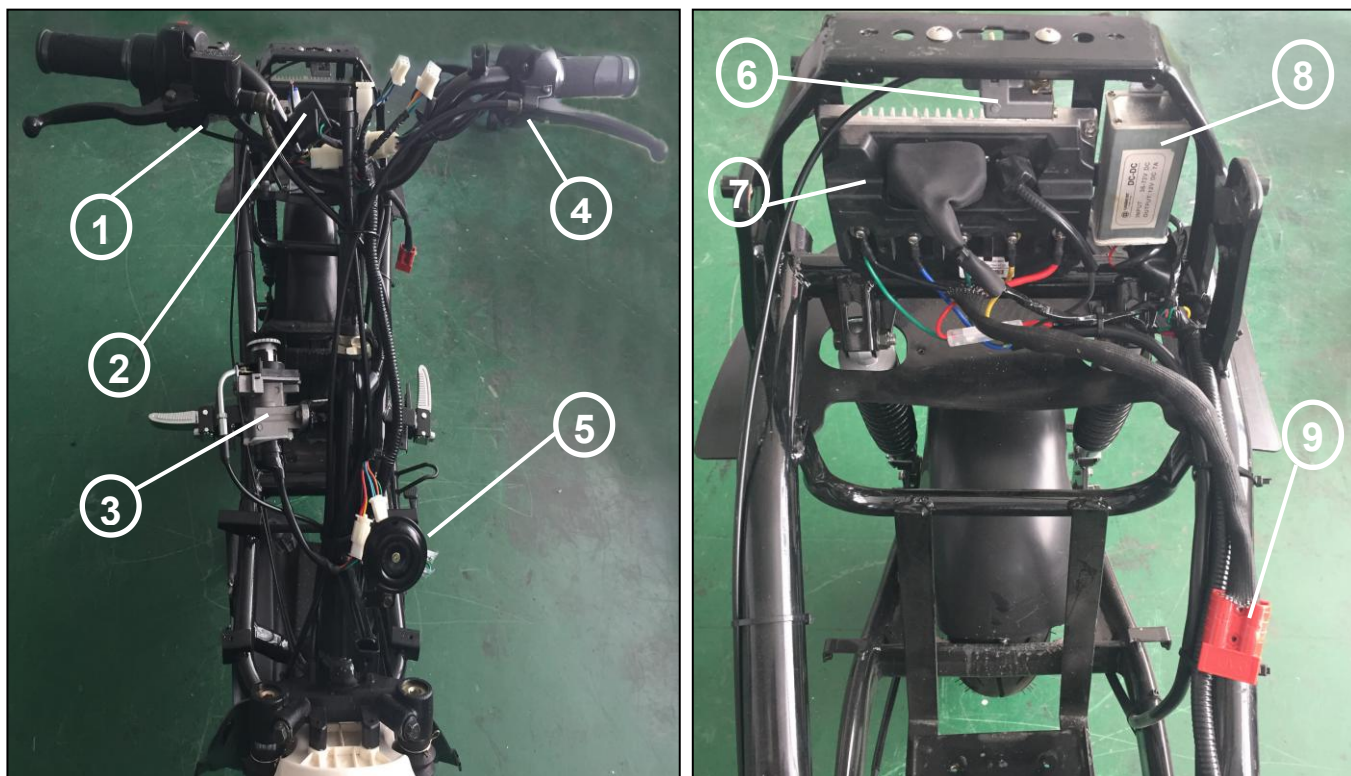
1. Place a stand under the vehicle to raise the front wheel off the ground.
2. Remove the front middle body cover (1), and loose the handlebar (4) in that way, that the lower triple tree can move out for some centimetres after the steering parts are released.
3. Release the fixation nut (2), the bearing. Do not loose The bearing balls.
4. Now you can crease the upper and lower bearings cages. Please use only high quality grease to keep water away.
5. After the bearings are greased replace the parts in reversed order.



WIRING DIAGRAM



## PART LOCATION - ELECTRICAL SYSTEM



## PART LIST - ELECTRICAL SYSTEM

- |                                   |                            |
|-----------------------------------|----------------------------|
| 1. Brake light switch - front     | 6. Seat Lock               |
| 2. Flasher                        | 7. Controller              |
| 3. Power lock module/ main switch | 8. Converter               |
| 4. Brake light switch - rear      | 9. Battery connecting wire |
| 5. Horn                           |                            |

## CONFIGURATION LIST OF ELECTRO VEHICLE

Type	Numbers in one group	Parameters of the charger					Parameters of the controller			Parameters of motor		
		Input voltage(V)	Maximum charge voltage(V)	Maximum charge current	Conversion current (A)	Temperature coefficient	Rated voltage(V)	Low-voltage protection point(V)	Current-limiting value (A)	Rated voltage(V)	No-Load RPM(rpm)	Motor power (W)
Lithium	1	220	67.2	5	0.18	2.5~4	60	52	45	60	570±3%	2000

## SPECIFICATION BATTERY

ITEM	STANDARD VALUE		
Lithium battery	Full voltage	67.2V	
	Rated capacity	20Ah	
	Weight	8.5kg	
	Length	260	
	Width	53	
	Height	374	
	Operating Temperature	Charging	0~45℃
		Discharging	-10~60℃

## BATTERY GENERAL INFORMATION

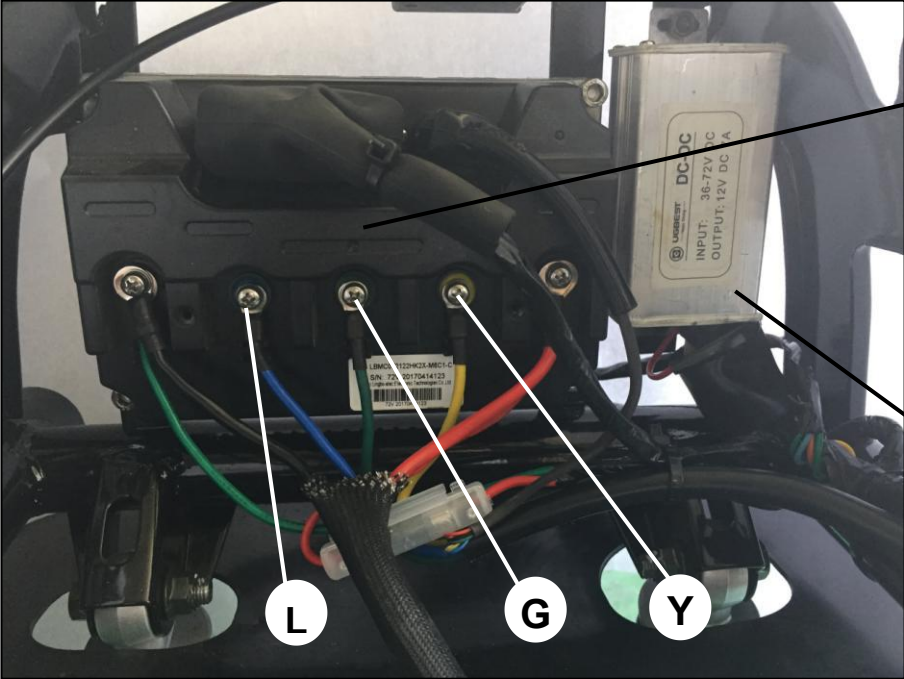
1. Please read the battery instructions and the label on its surface before use.
2. When in use, the batteries shall be kept out of heat、 high voltage and avoided children's touching. Do not drop the batteries.
3. Do not touch contacts together. Do not demolish or assembly the batteries by yourself. Do not put the batteries in the damp place to avoid danger.
4. When the batteries was stored for a long period, put it well in its half capacity. Do not wrap it with conduct material to avoid the damage caused by the direct contact between the metal and batteries. Keep the batteries in day places.
5. Well disposed the disused battery. Do not put it into fire or water.

**⚠WARNING**

1. When the voltage between the two el extrudes is over 36V, the safe voltage of human beings, you should not touch them with your body.
2. Forbid Disassemble Batteries



GENERAL INSPECTION



1. Controller
2. Converter

MOTOR CABLE INSPECTION

1. Remove the connection box cover.
2. Set the multimeter on the plug and measure as show in the table below.

	Y	L	G
Y		1.6Ω	1.6Ω
L	1.6Ω		1.6Ω
G	1.6Ω	1.6Ω	

Y—Yellow 黄色    L—Blue 蓝色    G—Green 绿色

NOTE

The results between each colour should be the same.  
If the results are not the same turn the rear wheel and measure again.

1. Switch on the ignition
2. Measure the voltage of the with the multimeter as shown in the table below.

no throttle:

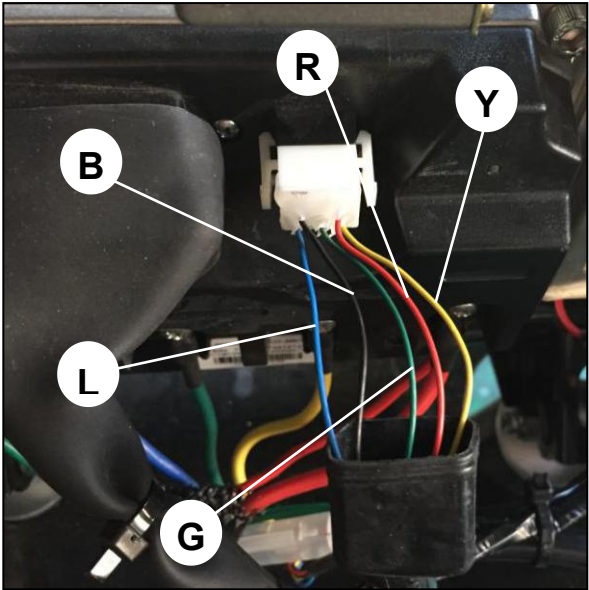
	B	R	Y	L	G
B		4-7V	5V	5V	5V

full throttle:

	B	R	Y	L	G
B		4-7V	2.5V	2.5V	2.5V

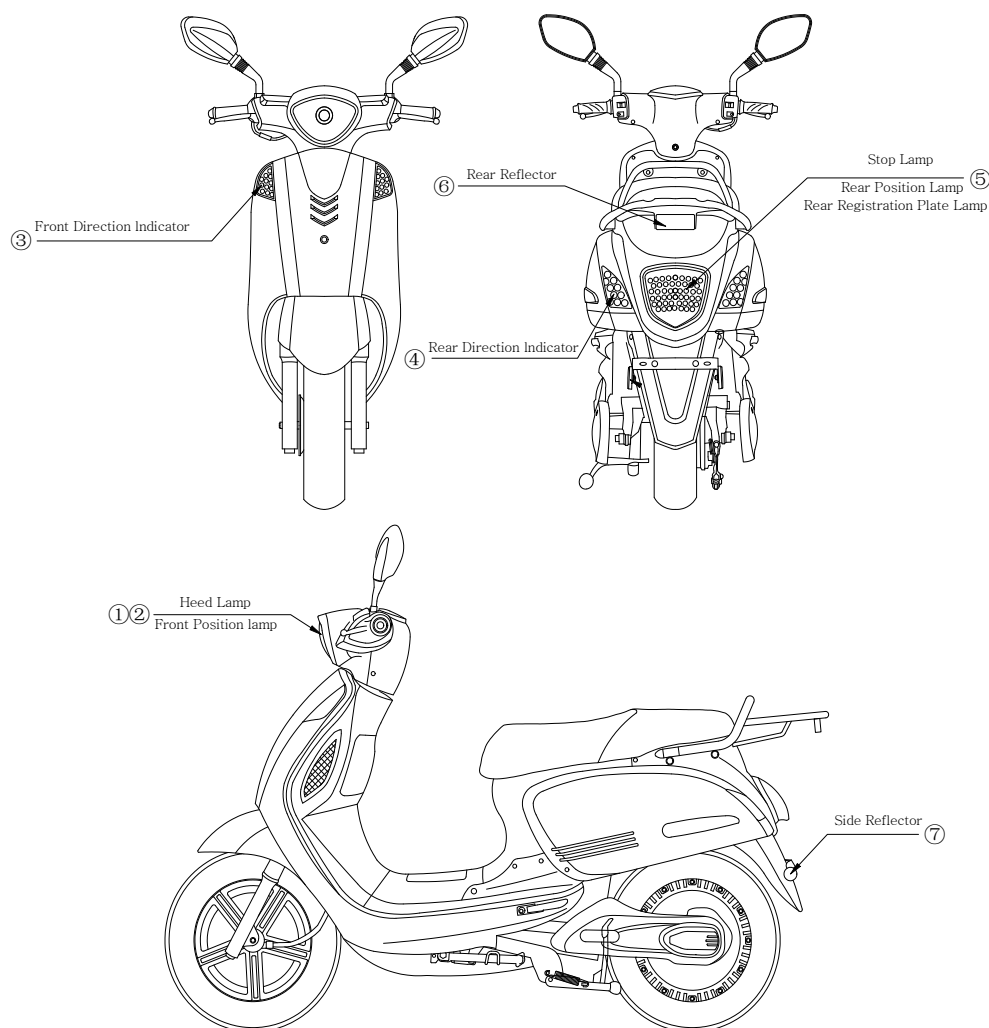
NOTE

If the results are not the same turn the rear wheel and measure again.





## PART LOCATION - ELECTRICAL SYSTEM




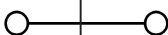


## PART LIST - LIGHTS / INSTRUMENTS SWITCHES

PART NO.	Lamp Function		QTY	Component type-approval mark	Color	Corresponding Tell tale	Max. Intensity
1	Head lamp	Driving beam	1	CR/BS PL E4 12.5↔0013348	White	Blue	22500cd
		Passing beam				--	--
2	Front position lamp		1	E4 50R-0013348	White	Via panel lamp	--
3	Front direction Indicator		2	11 E4→←50R-001308	Amber	Green	--
4	Rear direction Indicator		2	12 E4→←R50-001309	Amber	Green	--
5	Rear position lamp		1	E4 R50-0013349	Red	Via panel lamp	--
	Stop lamp				--		
	Rear registration plate lamp		1		White	Via panel lamp	
6	Non-triangular	Rear reflector	1	IA E9-02.1269	Red	---	---
7		Side reflector	2	IA E9-02.1270	Amber	---	---



MAIN SWITCH INSPECTION

- 1. Remove the side covers and the leg protection with floor panel.
- 2. Disconnect the main switch plug (3P) (1).
- 3. Use a continuity tester to measure the main switch as shown in the illustration.
- 4. If the main switch do not work correct replace it.

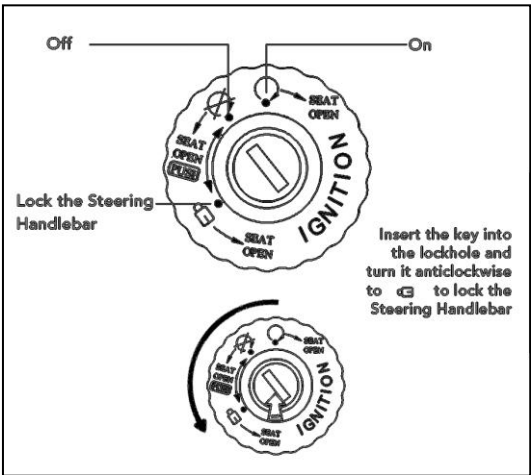
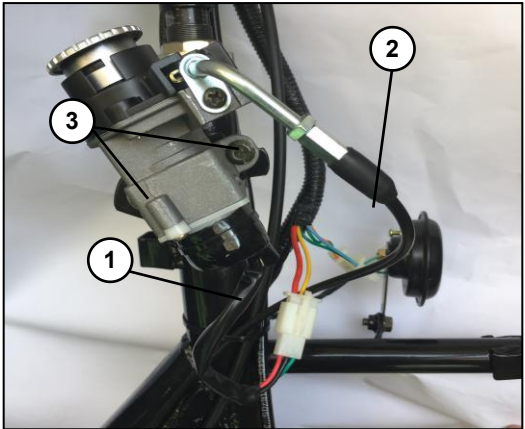
	R	Y
		
		
		

MAIN SWITCH REPLACEMENT

- 1. Follow points 1 and 2 from above description.
- 2. Disconnect the seat cable (2).
- 3. Remove the two bolts (3).

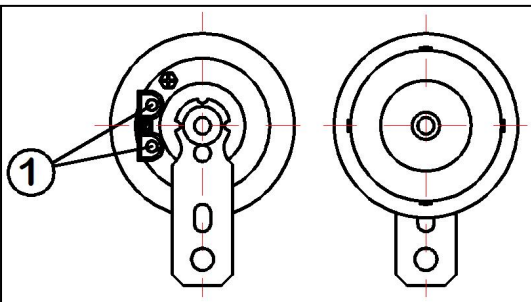
NOTE

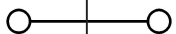
The main switch is combined with the steering lock. When you turn the handle bar to the left, turn the key of the main switch to the lock symbol and pull the key out the steering is locked. If the steering lock do not work correct replace the main switch. Follow the description above.



HORN INSPECTION

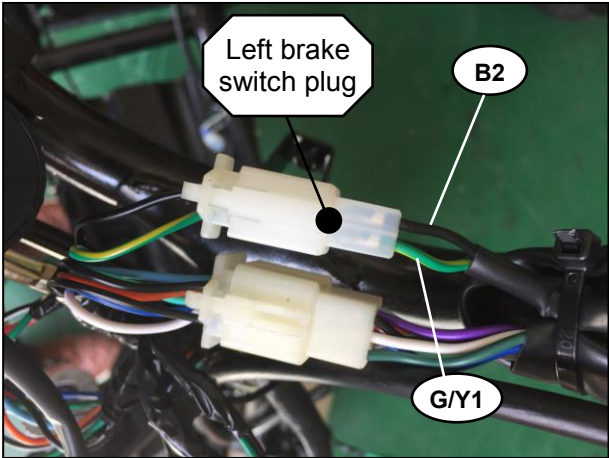
- 1. Remove the front cover.
- 2. Disconnect the horn wire.
- 3. The horn is works correct if it sounds when a 12V battery is connected to the terminals (1). Consider the correct connection of plus and minus pole during the inspection.
- 4. If the horn do not work correct replace it. If the horn work connected to a battery but not when connected to the handle switch left check the cables and the horn switches.
- 5. Disconnect the cables coming from the horn (green/ light green).
- 6. Use a continuity tester to measure the horn cables as shown in the illustration.



	G	Lg
left horn switch		
left horn switch pressed		

HANDLE SWITCH INSPECTION

- 1. Remove the head cover with speedometer and wipers.
- 2. Disconnect the related handle switch cable.
- 3. Use a continuity tester to measure the switches as shown in the illustrations below.
- 4. In case of damage the handle switch need to be replaced complete and does not need to be repaired.

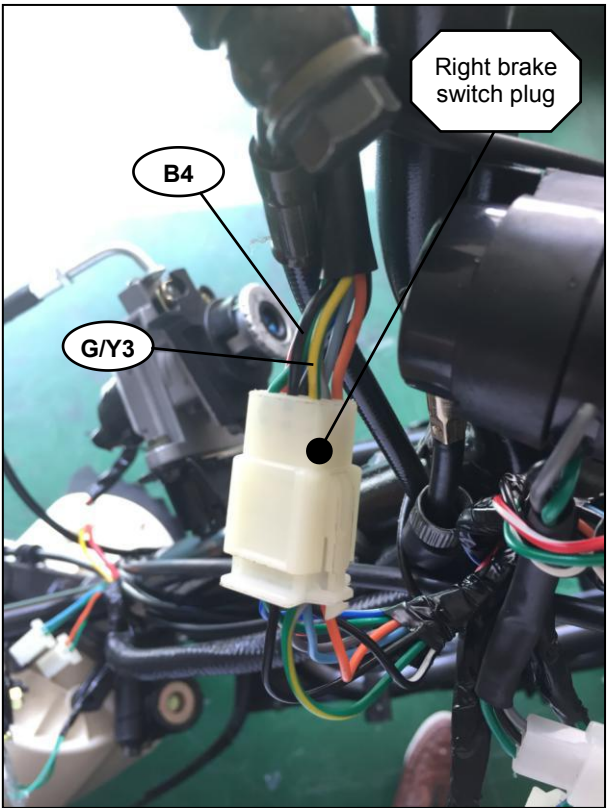


Left brake switch

	G/Y(1)	B(2)
brake lever		
brake lever pressed		

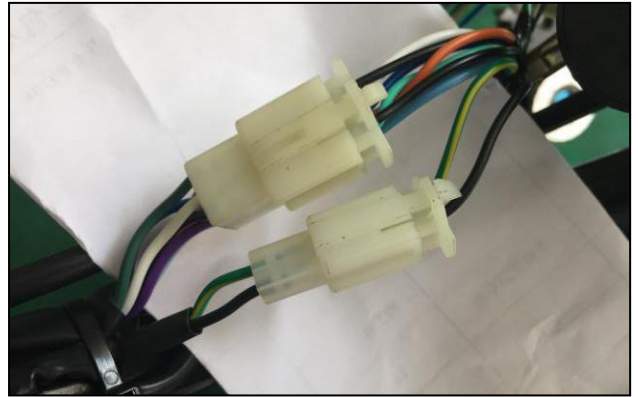
Right brake switch

	G/Y(3)	B(4)
brake lever		
brake lever pressed		



**LEFT HANDLE SWITCH INSPECTION**

1. Remove the rear handlebar cover.
2. Use a continuity tester to measure the switches as shown in the illustrations below.
3. In case of damage the handle switch need to be replaced.

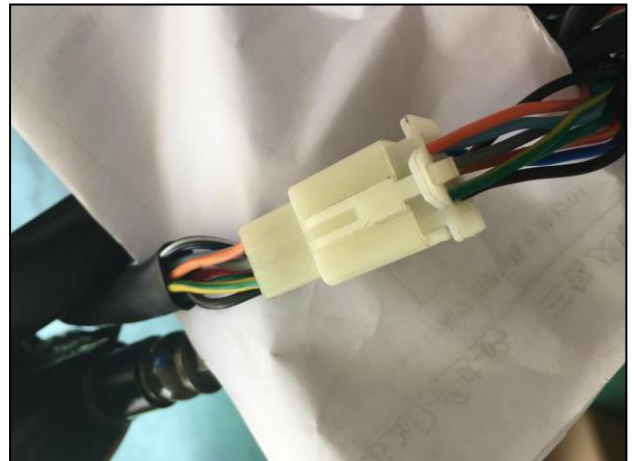


Left handle switch

		W	B	L
Low beam				
High beam				

		O	Gr	Lb
Winker left				
Winker off				
Winker right				

		B	Lg
Horn switch			
Horn switch pressed			

**RIGHT HANDLE SWITCH INSPECTION**

1. Remove the rear handlebar cover.
2. Use a continuity tester to measure the switches as shown in the illustrations below.
3. In case of damage the handle switch need to be replaced.

		B/W	L/W
Gear change switch	<b>ECO</b>		
Gear change switch pressed	<b>S</b>		

		O	Gr	Lb
Double flash switch				
Double flash switch pressed				

		R/Y	G
Start button switch			
Start button switch pressed			

red	R
black	B
white	W
blue	L
green	G
yellow	Y
orange	O
grey	Gr
light blue	Lb
light green	Lg

## BULBS REPLACEMENT GENERAL INFORMATION

### PREPARATORY DATA

Precautions on operation:

While trouble shooting electric faults, please check continuity of electric component as current flowing over it.

Confirm state of battery before any inspection, including battery voltage.

### FAULT DIAGNOSIS

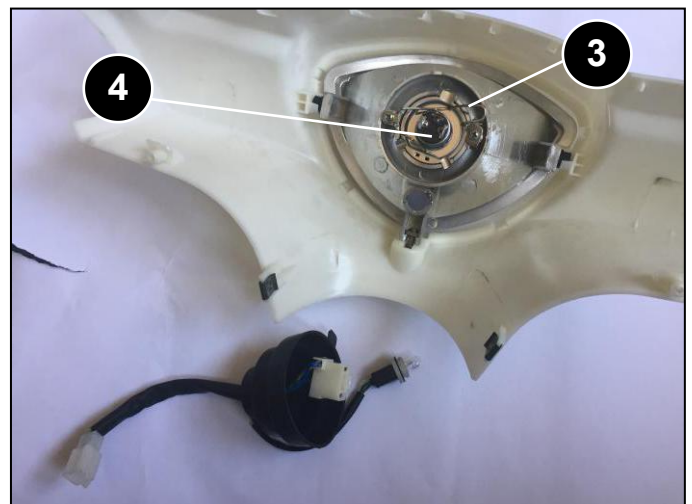
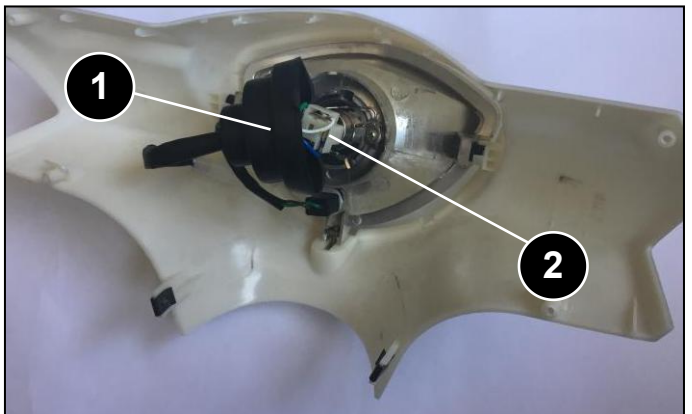
1. Turn on the main switch and the light switch.
2. Check rear light, front position light and low beam.
3. Turn on high beam and check if high beam is working.
4. Apply the front brake and check if brake light is working.
5. Apply the rear brake and check if brake light is working.
6. Turn on the left and right winker and check all winkers are working.

If the relative light is not working a reason could be:

1. A defect bulb.
2. A defect light switch.
3. The connector has a poor contact or the wire is broken.
4. The battery voltage is low.
5. If there is no electric power at all main fuse could be burned also.

### HEADLIGHT BULB REPLACEMENT

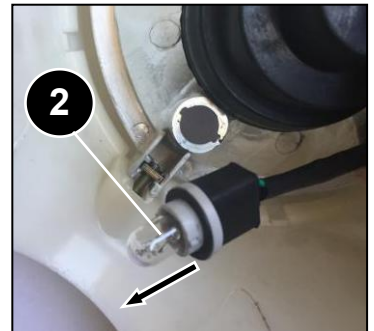
1. Remove the front handlebar cover.
2. Pull out the rubber pad (1).
3. Pull out (arrow) the plug (2).
4. Unthread the locking spring (3) to remove the headlight bulb(4).
5. Replace the defect bulb.
6. Assembling in reversed order.





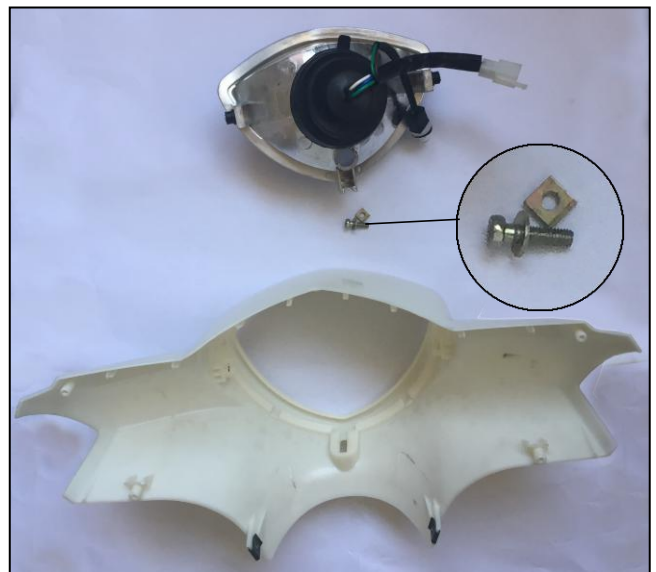
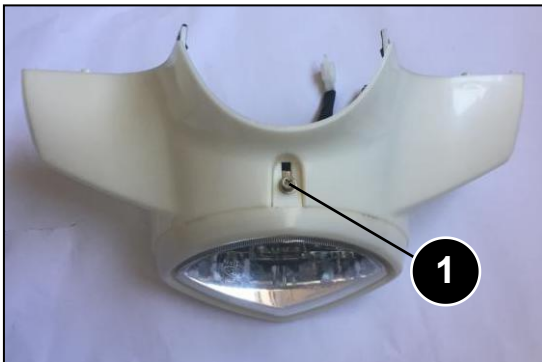
## POSITION LIGHT

1. If the position light (1) is defect, replace the position light (2).



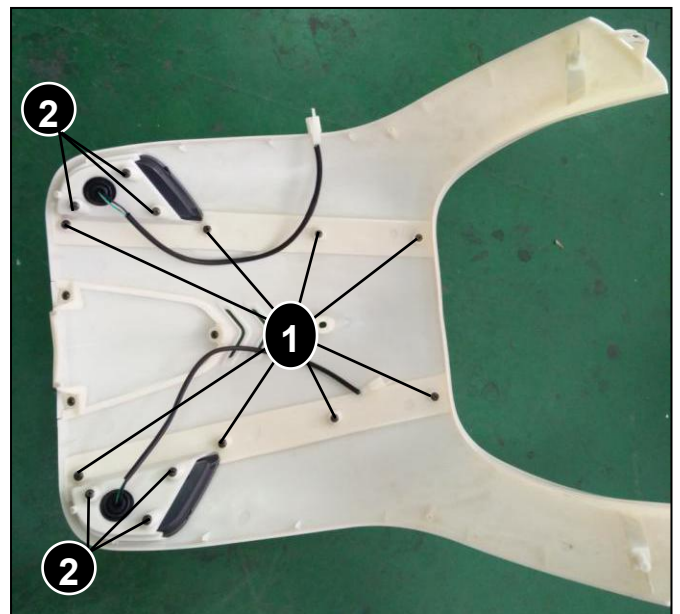
## HEADLIGHT REPLACEMENT

1. Remove the front handlebar cover.
2. Remove the bolt (1) to remove the headlight (2).



## FRONT TURNING LIGHT REPLACEMENT

1. Remove the front middle cover decoration.
2. Remove the eight screws (1) to remove the front middle cover decoration
3. Remove the six screws (2) to remove the front turning light ( L and R )

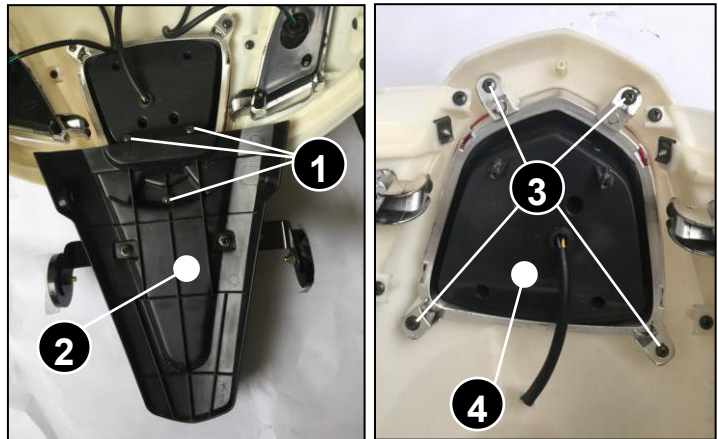


**REAR TURNING LIGHT REPLACEMENT**

1. Remove the rear side body panel.
2. Remove the six screws (1) to remove the rear turning light (2).

**REAR LIGHT REPLACEMENT**

1. Remove the rear side body panel.
2. Remove the three screws (1) to remove the rear mudguard (2).
3. Remove the four screws (3) to remove the rear light (4).

**NOTE**

Due to the front turn lights, rear lights, rear turn lights are LED, when they are broken, only for the whole lamp.

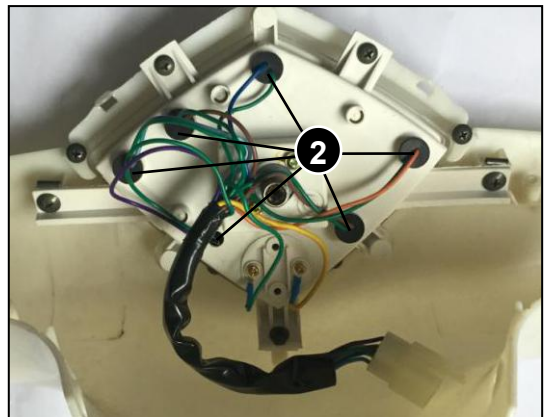
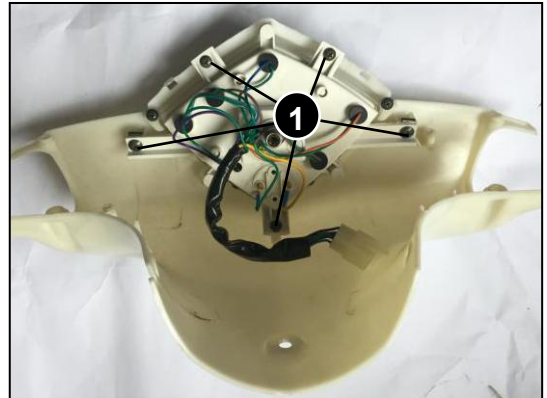
**TROUBLESHOOTING**

FAILURE	CAUSE	TO DO
Lights do not come on when ignition switch is on	Burned bulb or lights	Replace bulb or lights
	Faulty switch	Replace switch
	Broken or shorted wire	Check and repair
	Fuse blown	Replace fuse
	Weak battery	Charge battery or replace it
	Poor contact of connecting wire	Check and repair
Light dims	Faulty converter	Replace converter
	Wire or switch resistance too high	Check and clean/repair
	Faulty regulator/rectifier	Check and replace
Headlight does not change when dimmer switch is turn to Hi or Lo	Faulty or burned bulb	Replace bulb
	Faulty dimmer switch	Check and replace



## SPEEDOMETER/ INDICATOR LIGHTS REPLACEMENT

1. Remove the rear handlebar cover.
2. Remove the five screws (1) to remove the speedometer.
3. To remove the bulbs, pull out on the cables (2).



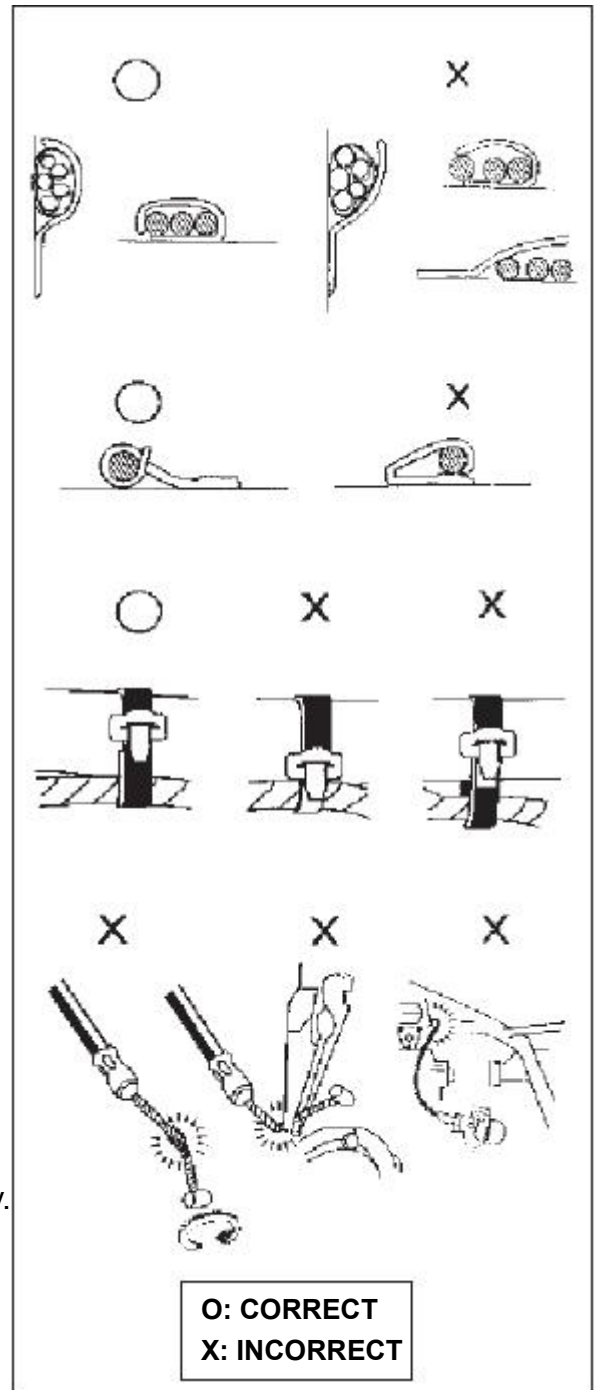
## SPEEDOMETER DESCRIPTION

1. High beam indicator
2. Left turn indicator
3. Total kilometers travelled
4. Battery indicator
5. Parking indicator & Fault signal flashing lamp
6. Right turn indicator
7. Real-time speed



## NOTE

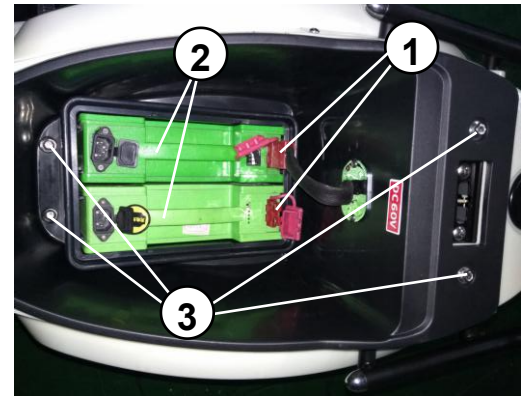
- Loose cable is a hidden trouble to electrical safety. After clamped check each cable to ensure electrical safety.
- It is not allowed to leave any wire clip bending towards bonding points.
- Bind each cable to its designated position.
- It is not allowed to lay a cable to end or a sharp corner on frame.
- It is not allowed to lay a cable to end of a bolt or screw.
- When laying a cable, keep it away from any heat source or any place where may bite it when it is moving.
- When laying a cable along a handle, avoid it being strained too tightly or loosely and it can not interfere with any adjacent part at any turning point.
- All cables should be laid smoothly without twist or knot.
- Before butt-jointing a connector, check if its sheath has been damaged and if it is overstretched.
- If a cable is at a sharp corner or outer corner, use tape or hose to protect it.
- After a cable is repaired, use tape to bind it securely.
- Keep all control cables from bend or twist because dumb control will result in case any control cable is damaged.



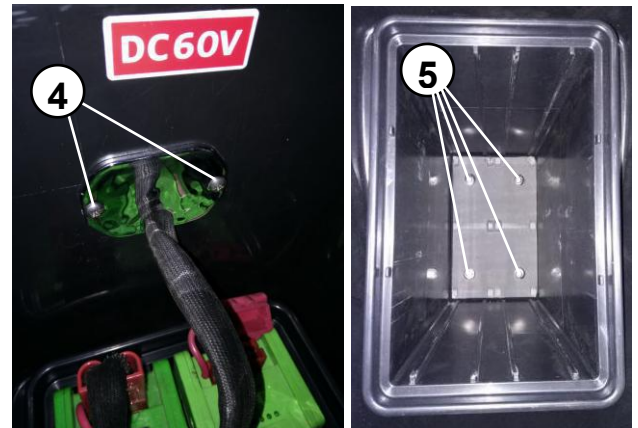
## COVER REPLACEMENT

### BATTERY BUCKET REMOVAL

1. Open the seat bench.
2. Pull out the battery plug(1) and take out the battery(2).
3. Remove the four bolts (3).



4. Remove the two screws (4) to remove the battery connecting wire.
5. Remove the four bolts (5).



### REAR CARRIER REMOVAL

1. Remove the four bolts to remove the rear rack (1).

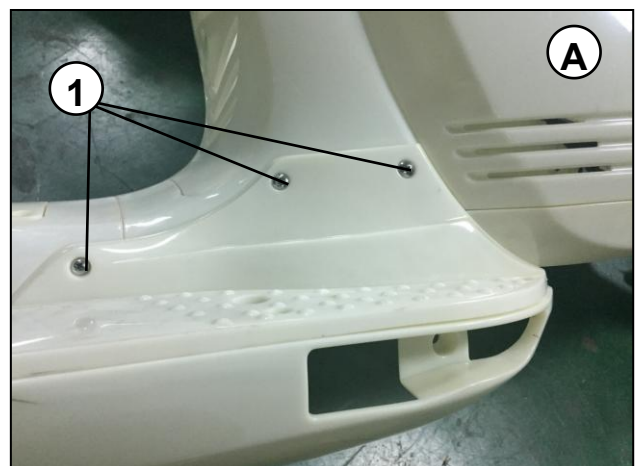


### REAR BODY PANEL REMOVAL

1. Remove the three screws (1) to take out the footboard decoration panel (A).

#### NOTE

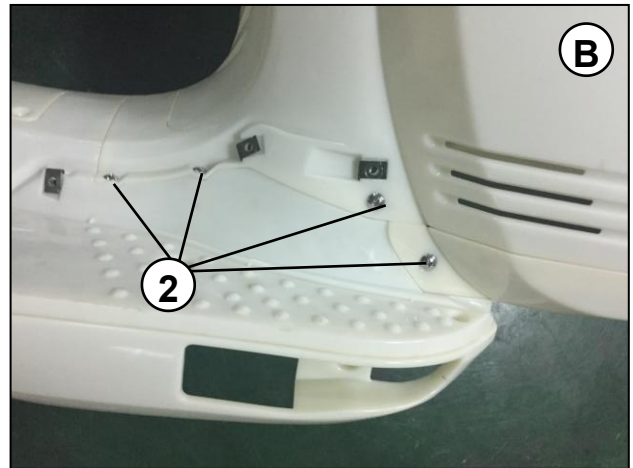
Only one side (left side) is illustrated.



2. After taking out the footboard decoration panel, remove the four screws (2)(B).

**NOTE**

Only one side (left side) is illustrated.

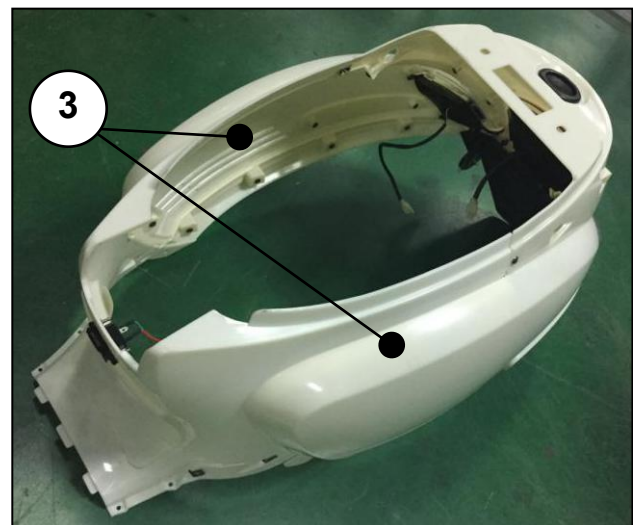


3. Use the same method to remove the other side (right side).



4. Pull the rear body panel backwards (arrows).

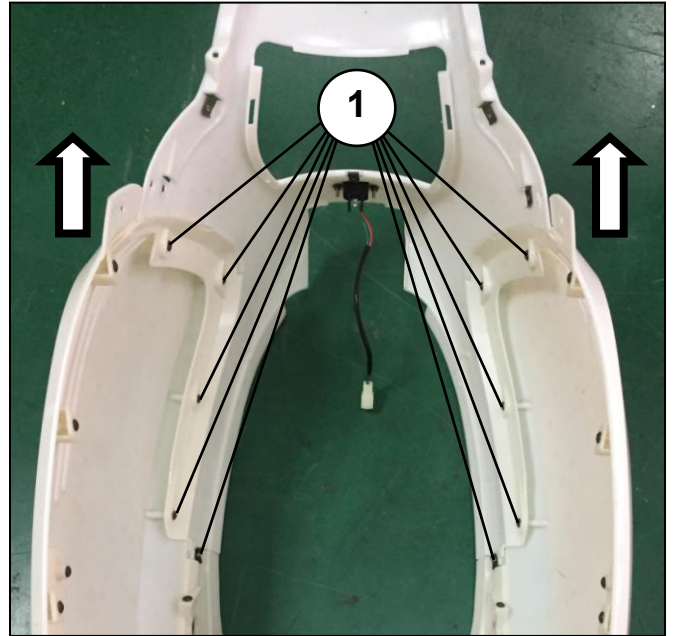
5. Then you can get the rear body assy (3).





## REAR DECORATIVE PLATE ASSY REMOVAL

1. Remove the eight screws (1) to remove front cover of storage box (arrows). **(Refer to A)**
2. Remove the eight screws (2) to remove the rear decorating plate. **(Refer to B)**

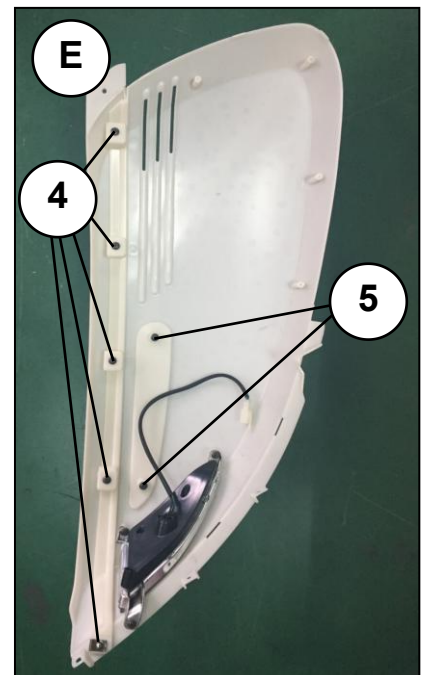
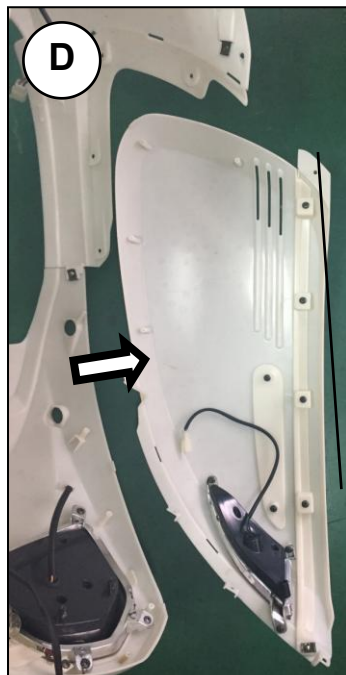
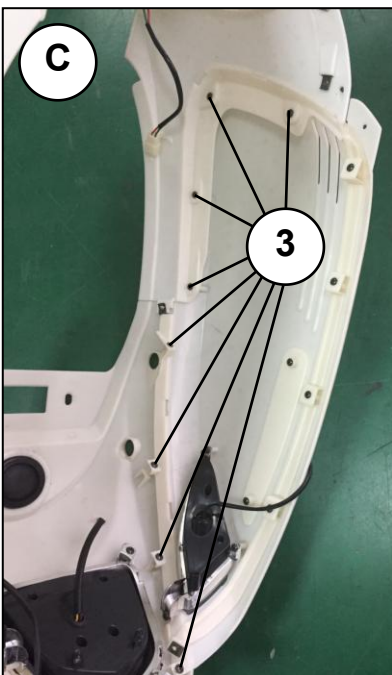


3. Remove the eight screws (3) to remove the Left decorating plate. **(Refer to C - D)**
4. Remove the five screws (4) to remove the rear left protecting plate. **(Refer to E)**
5. Remove the two screws (5) to remove the rear left decorating plate. **(Refer to E)**



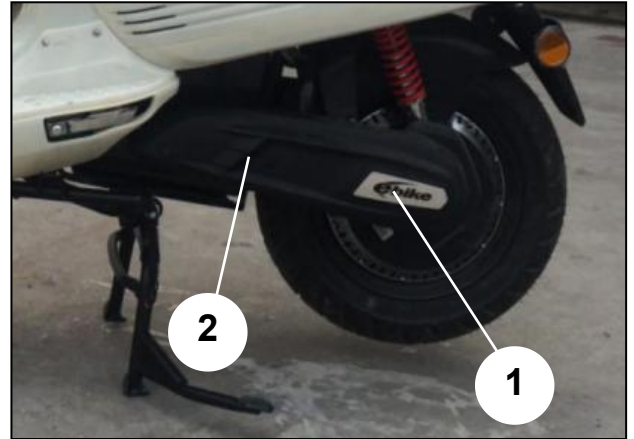
### NOTE

Only one side (left side) is illustrated.



## REAR FORK COVER LEFT/ RIGHT REMOVAL

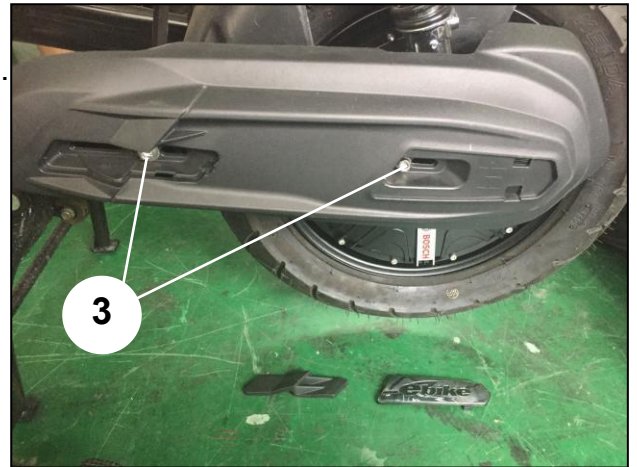
1. Pull out the rear fork cover chrome-plating decoration (1) and pp small cap (2) by using a screwdriver.



2. Remove the two bolts to remove the rear fork (3).

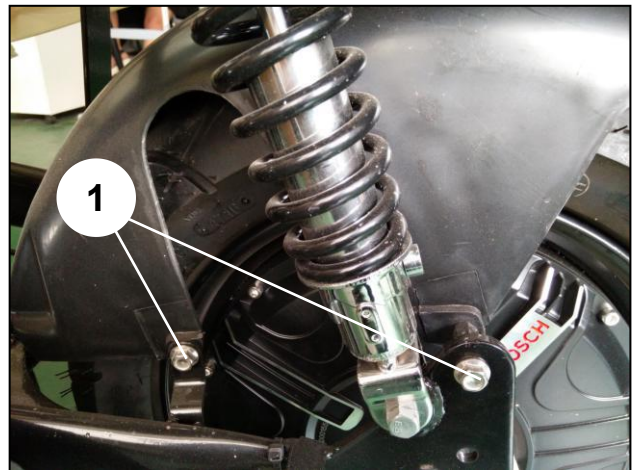
### NOTE

Only one side (left side) is illustrated.

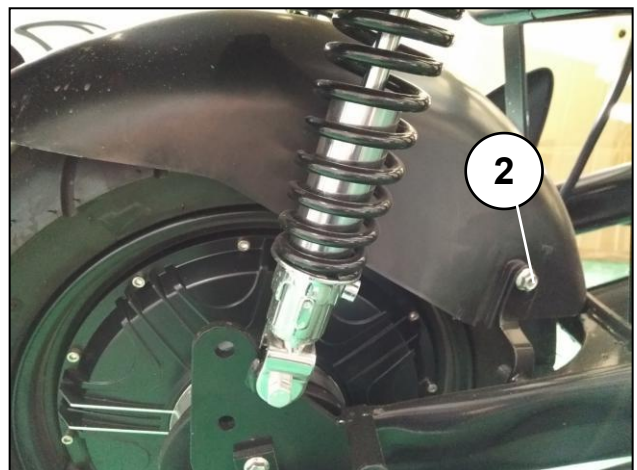


## REAR INNER MUDGUARD REMOVAL

1. Remove the two bolts on the left (1).



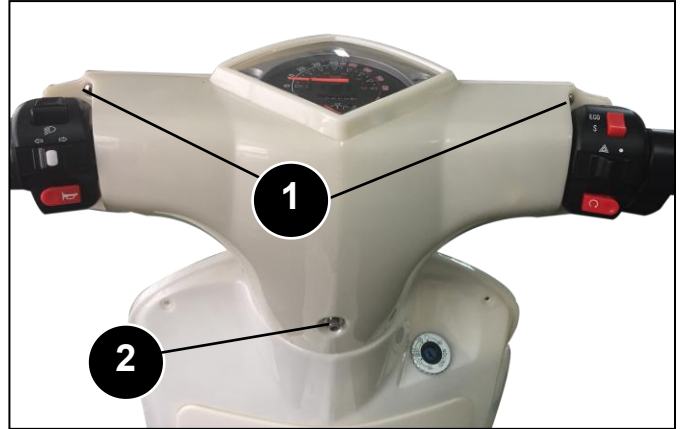
2. Remove the one bolt on the right (2).



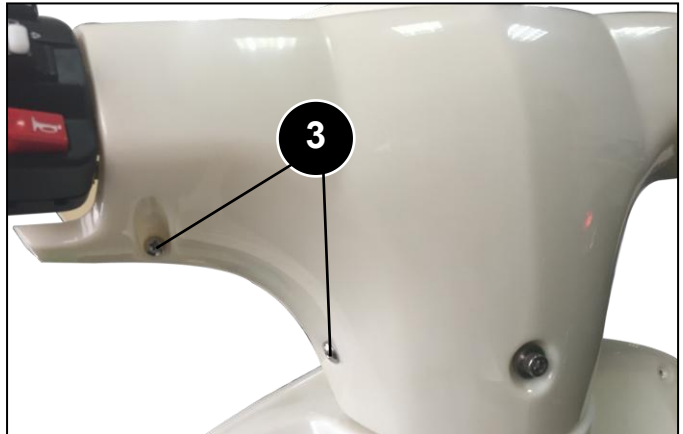


## FRONT HANDLEBAR COVER REMOVAL

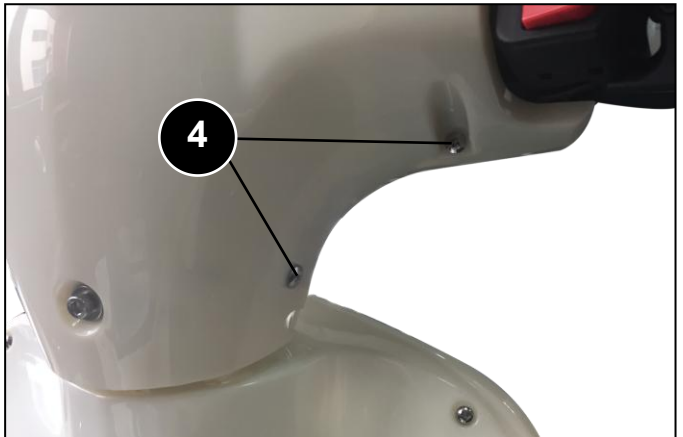
1. Remove the two screws(1) and one bolt (2).



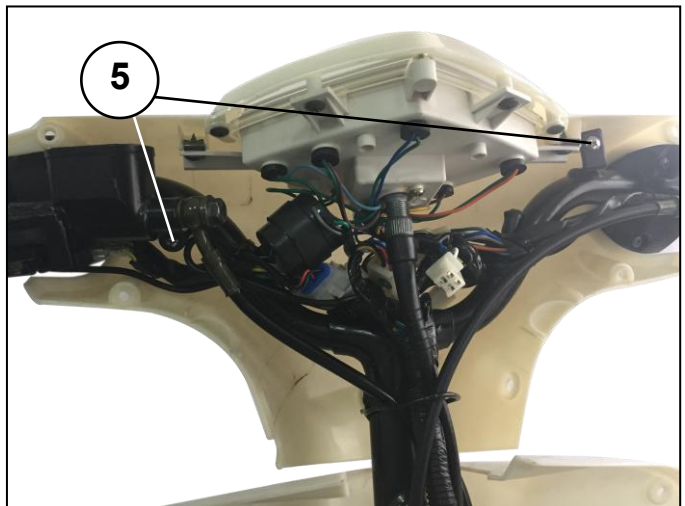
2. Remove the two screws (3) on the left.



3. Remove the two screws (4) on the left.



4. Remove the two screws (5) to remove the front handlebar cover.

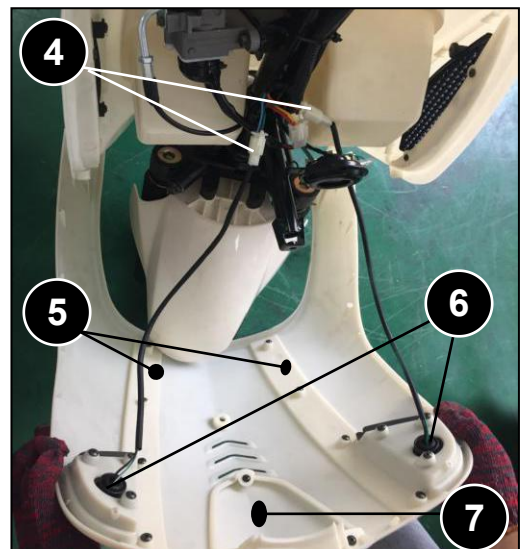
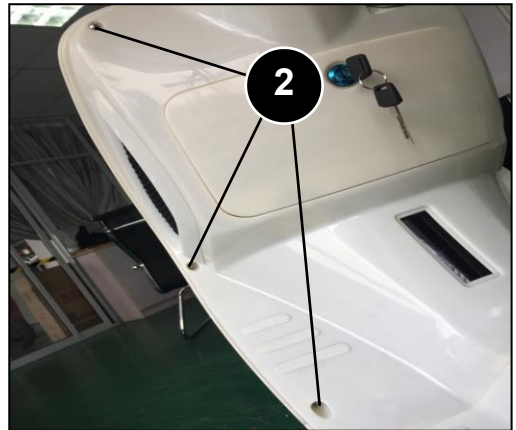
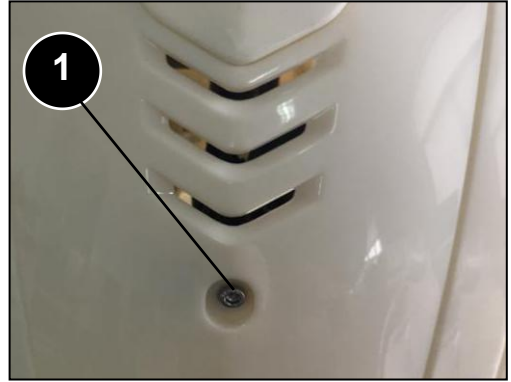


## FRONT MIDDLE COVER REMOVAL

### NOTE

It is not necessary to remove the front and rear handlebar cover.

1. Remove the front bolt (1).
2. Remove the left three screws (2) ,remove the right side in the same way.
3. Remove the lower left two screws (3) ,remove the right side in the same way.
4. Disconnect the cable (4) coming from the front middle cover.
5. Remove the left and right front cover decoration (5) and left and right turning light (6)
6. Remove the front small cover (7).

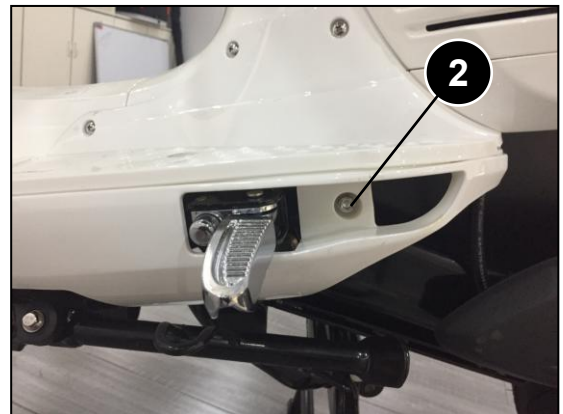


## TOOL BOX/FOOTPLATE REMOVAL

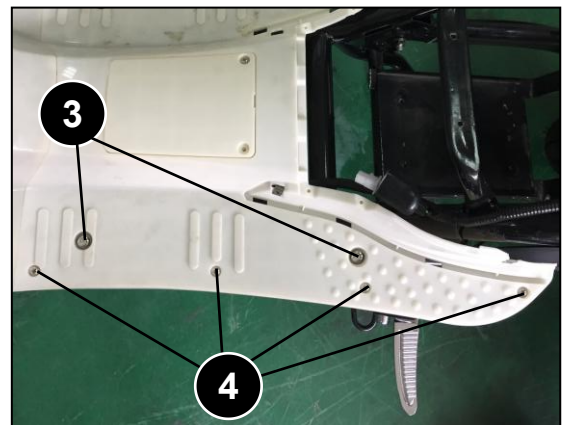
1. Remove the lower left two screws (1) ,remove the right side in the same way.



2. Remove the left and right pedal bolt (2),right side is not illustrated.

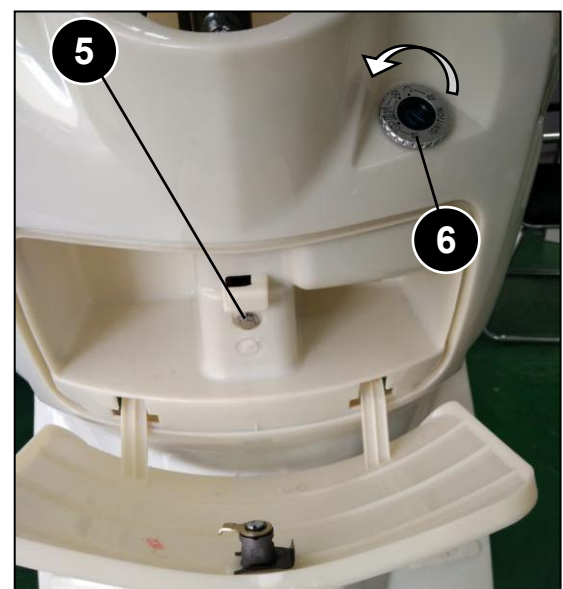


3. Remove the footplate four bolt (3) and the front protecting plate eight screws (4),right side is not illustrated.

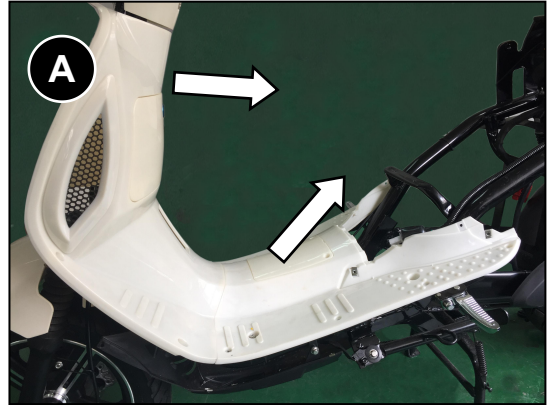


4. Remove the tool box inner bolt (5).

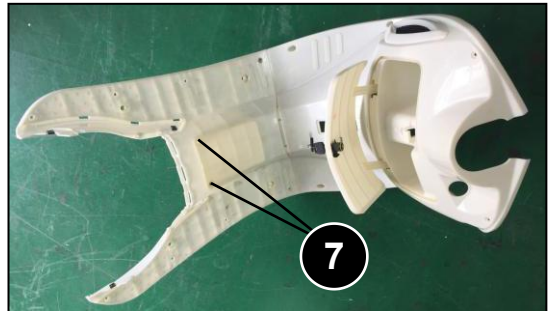
5. Turn the main switch cover (6) to the left (arrow) till you can pull it out.



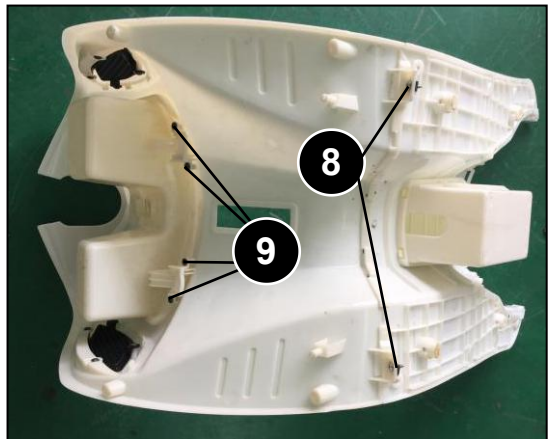
6. Pull the tool box and footplate removal backwards as shown in the picture (A).



7. Remove the two screws (7) to remove the footplate small cover.



8. Remove the two screws (8) to separate the toolbox from footplate.



9. Remove the four screws (9) to remove the two toolbox pressers.

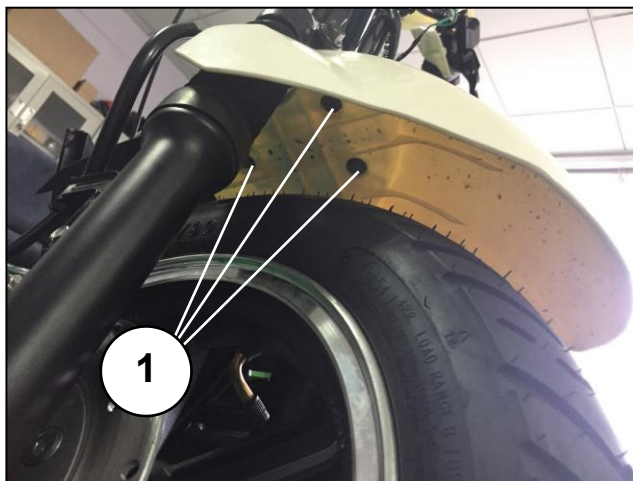


10. Remove the toolbox cover.

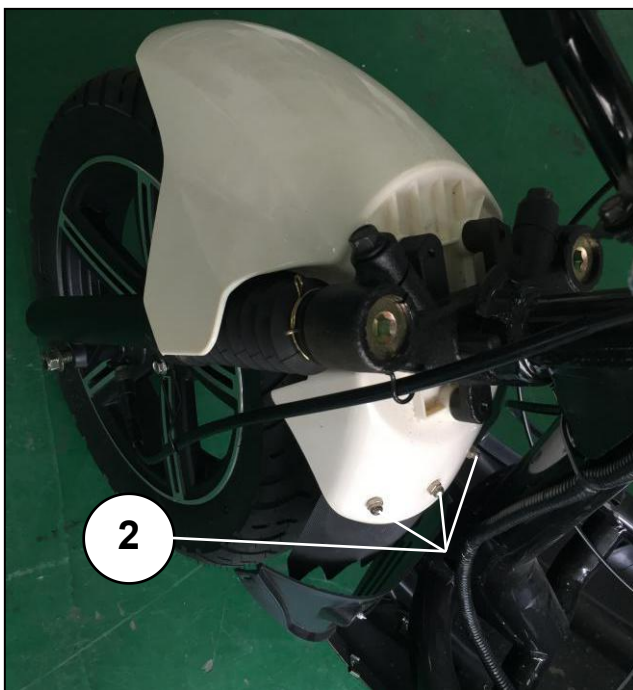


## FRONT MUDGUARD

1. Remove the three bolts (1) to remove the front mudguard.



2. Remove the three cap nuts (2) to remove the pvc plate.



## BACK VIEW MIRRORS

At all repairs in the area of the handle bar is advised to remove the back view mirrors.

To prevent damage during installation of the back view mirror consider that on the right side is a left-handed thread and vice versa.

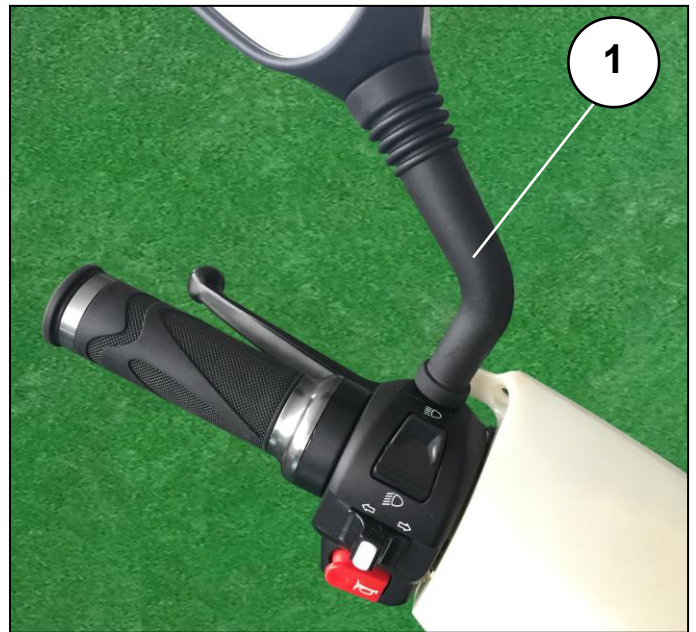
**The certification number are E7 81R-000507**

### NOTE

Only one side (left side) is illustrated.

### BACK VIEW MIRRORS REMOVAL

1. Push up the rubber sleeve (1).
2. Turn out the left and right back mirror counterclockwise.
3. The left and right sides are all right thread.



### BACK VIEW MIRRORS INSTALLATION

1. Turn in the mirrors in reverse order.
2. If the position is correct fix the mirror with the fixing nut (2).





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