SUR-RON LIGHT BEE QL3000DY-2
SERVICE MANUAL

1. Brief Introduction

1.1Safety warning

Do reading the chapter carefully before the repair & maintenance

This service manual is used to guide professional technicians. Please don't do the repair and maintenance with the content in this manual neither you take necessary training nor have any operation experience.

The operations in this manual can only be done in suitable maintenance workshop. Ensure all essential tools are well prepared before the repair and maintenance.

The power source of LIGHT BEE must be cut off before any operation on the bike. The failure to cut off its power source may cause serious injury and even death through electric shock or disassembly and assembly of parts.

When you do the repair and maintenance, please do wear the safety equipment (working jacket and working boots etc.) in case of burning, cutting, collision or other accidents. And use protective goggle or gloves if necessary.

Chongqing Qiulong Technology Co., Ltd (Hereafter called **Sur-Ron**) has the power of interpretation for all information in the manual. Sur-Ron aimed to build the best electric bike in the world, therefore, any improvements, which can make the bike have better performance and quality, Sur-Ron will keep doing improvements（upgrade data of specific parts design, material，surface coating and technique detail etc. will not be provided.）Sur-Ron might discontinue or optimize a certain model to adapt to the local regulations on specific market. If any content missed in this manual, or the bike you got is different from the description of this manual, please ask the local importer or dealer for help before you do the repair and maintenance.

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1.2 Use of the manual

The symbol represents the dangers the bike may cause or other dangerous situations.

The symbol represents the dangers which may cause serious physical injuries.

The symbol represents the potential dangers which can cause harm to health.

1.3 Disclaimer

Modification of the bike may cause physical injuries.

The modification of the bike without approval from Chongqing Qiulong Technology Co., Ltd. will lead to the following results:

- Loss of warranty.
- Needs different type of driving license.
- Accidents and serious injuries.

Please read local provisions about electrombile and motor vehicle before using Light Bee bike.

According to the certification of L1e-B electric moped scooter that Sur-Ron Light Bee has passed, its highest speed is 45km/h, so it is not allowed on expressway or the road segment with the minimum speed of more than 45km/h.

If you have any question, please contact official dealer of Chongqing Surron Technology Co., Ltd.

The applicable laws require you to provide the following information:

- Your age.
- The equipment necessary for special route.
- Special license for the bike.
- The area with restrictions on vehicles.

2.Technical specification

2.1Bike parameters

Electromotor	
type	Brushless DC motor (maximum power 4.0W) PMAC radial flow brushless, air-cooled and integrated rotate speed and temperature sensor.
control unit	AC/DC three-phase control unit (maximum power 60V-80A); two available driving mode: SPORT：2 kW ECO：0.9 kW
maximum speed	≤45 km/h
power source	
type	high-expanded ternary lithium power battery(60V32AH)
rated capacity	1900wh
charger	The special edition high-performance portable charger for LIGHT BEE QL3000DY power battery Power: 600 W Input: 110V AC or 240V DC (according to local voltage) Output: 67.2V DC/10A
charging time (standard)	0%-100% - 3.5 hours 0%-95% - 3 hours 0%-80% - 2 hours
mileage	
continuation of journey	ECO mode (average speed 25km/h)>100km
electromotor	double-stage reduction drive system
bike frame/hanger bracket/brake	
bike frame	Double-beam cradle type, lightweight aluminum alloy forge

rear absorber	multi-link central shock-absorb system
stroke of front fork	200mm.
stroke of rear wheel	210mm.
front brake	target at 4-piston hydraulic disk brake, disk 203mm
rear brake	target at 4-piston hydraulic disk brake, disk 203mm
front tire	cross-country 70/100-19
rear tire	cross-country 70/100-19
front wheel disk	Aluminum- 19*1.4
rear wheel disk	Aluminum- 19*1.4

front absorber	double-shoulder fully adjustable oil pressure reed inverted front absorber
rear absorber	multi-link fully adjustable damping single-tube air pressure damping system
size	
wheel base	1,230mm
height of vehicle seat	815 mm
front rake of seat tube	26°
ground clearance	270 mm
total length	1860 mm
width	780 mm
height	1,050 mm
weight	
no battery	42Kg
bike	50 Kg
load capacity	100 Kg

2.2 Torque specification of important screws

serial number	item	diameter of thread mm	tightening torque N.m
	install left and right lower controller support	M6	8N•m
	fasten front brake disk	M5	8～10N•m
	fasten rear brake disk	M6	10～12N•m
	fasten rear chainring	M8	20～25N•m
	rear absorber, rear rocker arm connection rod	M8	20～25N•m
	fasten bolt of belt wheel	M6	12N•m
	fasten bolt of output shaft sprocket	M6	12N•m
	fasten nut of front belt wheel	M12	40～50N•m
	attachment bracket of left and right pedals and support of left and right pedals	M10	40～45N•m
	fasten lower battery support plate	M6	8N•m
	fasten bolt of connecting plate	M6	10N•m
	fasten bolt of bike stem	M5*25	5-6N•m

	fasten bolts of bike stem and handlebar tube	M5	5-6N•m
	fasten front wheel axle	M12	20～25N•m
	fasten front disk brake	M6	12N•m
	fasten back fork shaft	M10	35N•m
	fasten auxiliary frame and bike frame	M8	20N•m
	fasten nut of seat cushion	M6	8N•m
	rear absorber, bike frame and back fork	M8	25-30N•m
	fasten rear wheel axle	M12	55～60N•m
	fasten rear disk brake	M6	12N•m
	fasten electrical motor	M8	25N•m
	fasten controller and controller support	M6	8-10N•m
	fasten pedal and bike frame	M8	25-30N•m
	fasten controller protector bolt	M8	20N•m

2.3 The highest speeds under different battery capacities (reference)

serial number	battery capacity	speed(km/h)
1	100%	42.8
2	90%	42.3
3	80%	41.6
4	70%	40.9
5	60%	40.1
6	50%	39.4
7	40%	38.7
8	30%	37.8

2.4 Bike arrangement

2.4.1 Position of bike parts

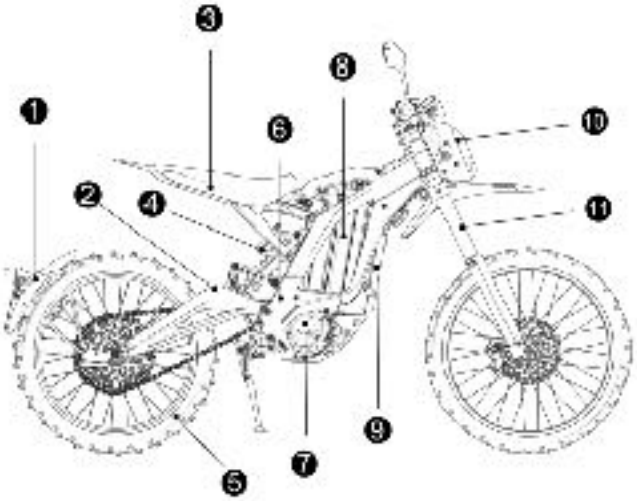


Fig 1

1. Rear fender assembly
2. Rear bottom fork
3. Seat cushion
4. Rear absorber
5. Tire
6. Bike frame
7. Three-phase brushless DC motor
8. Ternary power lithium battery
9. Control system
10. Headlight
11. Front absorber

2.3.2 Position of head parts

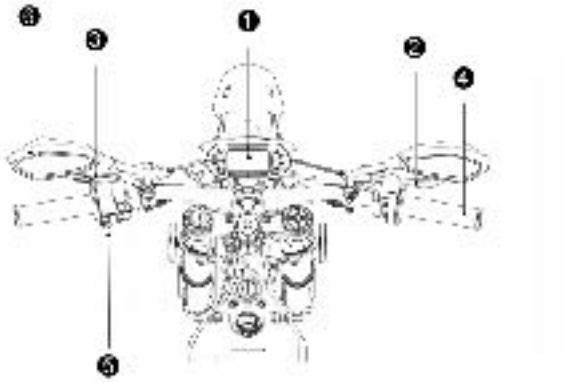


Fig 2

1. LCD Speedometer
2. Front brake handle
3. Rear brake handle
4. Throttle grip
5. Control switch
6. Rear-view mirror

2.3.3 LCD Speedometer functions

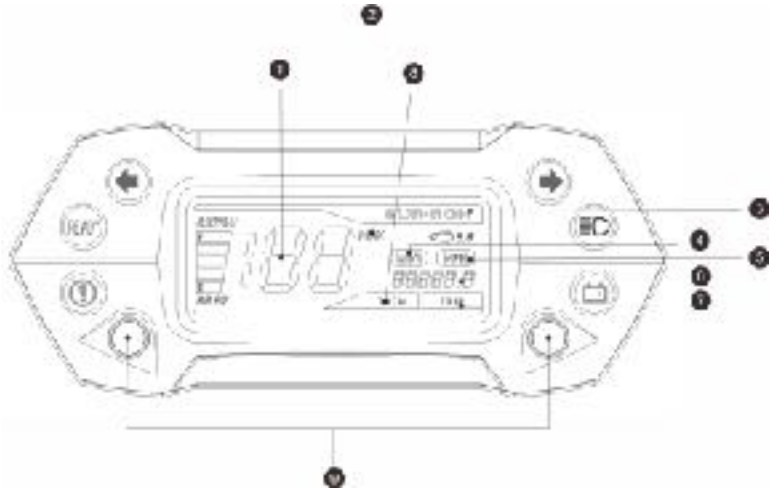


Fig 3

1.current speed
2.Top speed notice
3.brand logo
4.KMH indication
5.MPH indication
6.Mileage
7.Single trip distance
8.Trip distance in total
9.Buttons for function selections

3. Vehicle operation

This chapter includes all necessary knowledge related to Light Bee operation you need to learn about:

When stop using SUR-RON light bee QL3000DY, cut off main power switch.
Just to move the bike, turn off power switch.

If you plan to use the bike after more than 30 days, we suggest you to take battery down, keep its capacity not less than 50% and charge it at least once per month. Only the charger and cable equipped for the bike can be used because they are specially designed for the bike.

Only original charger can be used in charging
In order to achieve the best battery performance, charge the bike immediately after use every time.

Full discharge may damage battery

The charging and electric power storage not conforming to the instructions in the manual will invalidate the warranty of battery. These instructions are the results of strict test and can help to achieve the maximum performance and longest service life of battery.

Cut off air circuit breaker or dismount battery in repair or maintenance of bike. Hot-line work is not allowed in case of part damage or accidents

3.Repair tools and preparation work (tools can be arranged by yourself or purchased from Chongqing SUR-RON Technology Co., Ltd.. The special brake mineral oil should be purchased from Chongqing SUR-RON Technology Co., Ltd.)

4.1 Light Bee's special repair and maintenance tool kit

1、 inner hexagonal spearhead: S3, S4, S5, S6, S10

2、outer hexagonal spearhead: S12, S17

3、Round nut four-claw sleeve: S10

4、cross screw driver

5、AVO meter

6、original special brake mineral oil (LBN)

7、lubricating grease

4.2 Fix Light Bee

In terms of some maintenance operation of Light Bee, we suggest to fix Light Bee according to the step.

In an open area, turn off power source, open Light Bee's side stand on floor.

5. Disassemble and assemble battery (see Fig 4)

5.1After turn off power switch, plug key into① battery compartment, then turn key anticlockwise to open cover of battery compartment②

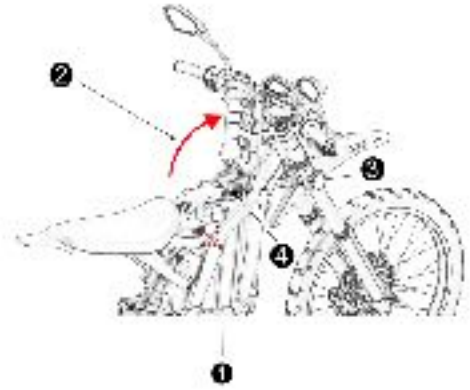


Fig 4

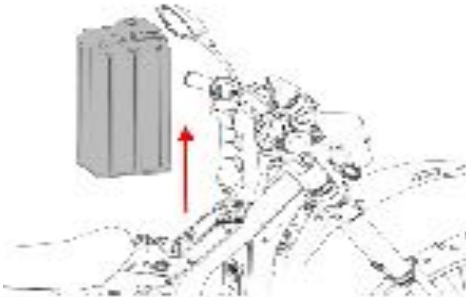


Fig 5

Cut off air circuit breaker, power source and disconnect output power line and signal line of battery③，④

Hold the lifting handle of battery, lift it, then take battery out (see Fig 5)

5.1.1 Assembly

• Assemble battery according to the inverse disassembly steps.

6. Disassemble, assemble and adjust damping system

6.1 Adjust compression damping of front absorber (see Fig 6)

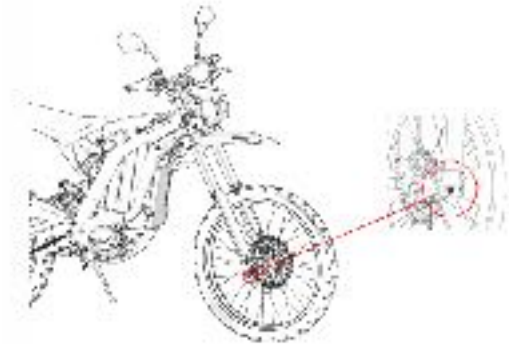


Fig 6

The compression damping of front absorber is adjusted through the standard valve core at the lower right. High-pressure pump is necessary. The recommended pressure is 7-10BAR(100-150 psi).

6.2 Adjust the setting of absorber

6.2.1 Tune front absorber (see Fig 7)

Adjust rebound damping (right absorber)

turn to +

restrain increase (slower)

turn to -

restrain decrease (faster)
preload adjustment (left absorber)
turn to +
increase of spring preload
turn to -
reduction of spring preload

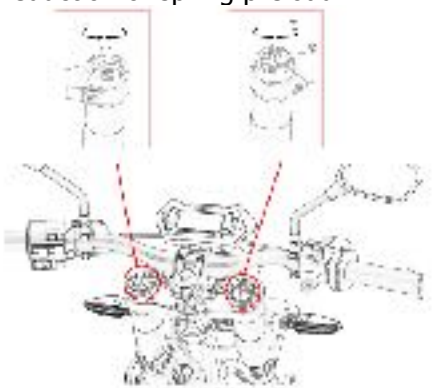


Fig 7

6.2.2 Tune rear absorber (see Fig 8)
regulating valve of compression damping force
turn to +, compression pressure increases(harden)
turn to -. compression pressure lowers (soften)
regulating valve of rebound damping force
turn to +, restrain increase (slower)
turn to -, restrain decrease (faster)

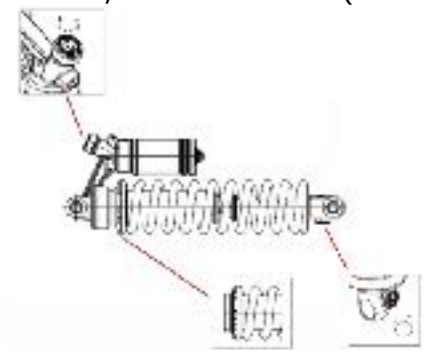


Fig 8
adjustment of spring preload
turn nut clockwise to increase preload force
turn nut anticlockwise to reduce preload force

6.3 Damping and lubrication

Warning: Light Bee QL3000DY absorber is designed for non-detachable, don't attempt to open or disassemble absorber.

Don't disassemble Light Bee QL3000DY's absorber. Please lubricate absorber according to the following steps and keep its best state:

- dismount protective cover. (see Fig 9)
- unscrew dustproof ring support and slide it along stanchion
- clean the dust on absorber stanchion (mud and old lubricating oil)
- Apply a layer of special lubricating oil for Light Bee QL3000DY between stanchion fixed seat of dustproof ring.
- Tighten dustproof ring to keep lubricating oil inside absorber.

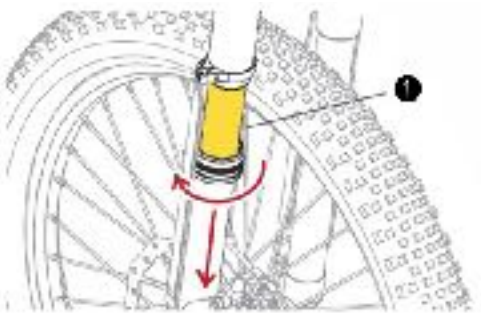


Fig 9

6.4 Disassemble and assemble front damping system

6.4.1 Disassemble front case and instrument (see Fig 10)

• Dismount bolts of case①②, take down front case and disconnect lamp line

• Dismount bolts of support of front case③④, disconnect instrument line and take down instrument and support of front case.

6.4.1.1Assembly

• Assemble front damping system according to the inverse disassembly steps and fasten it with the torque force of 10~12N.m.

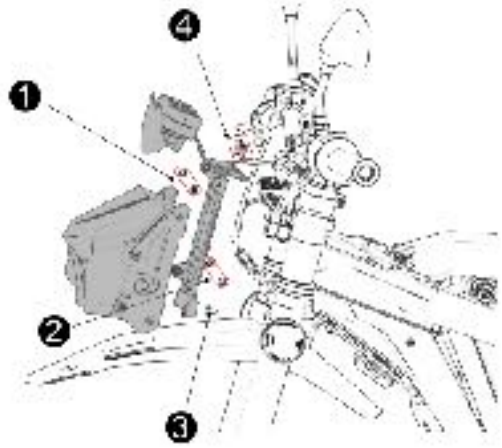


Fig 10

6.4.2 Disassemble headlight and front turning light (see Fig 11)

.Dismount turning light, install nuts and take down turning light⑤

.dismount bolts of support of front case② and separate headlight and front case①③

.dismount bolts of headlight and separate headlight and front case①④

6.4.2.1 Assembly

• Assemble headlight and turning light according to reverse disassembly steps and fasten them with the torque force of 10~12N.m.

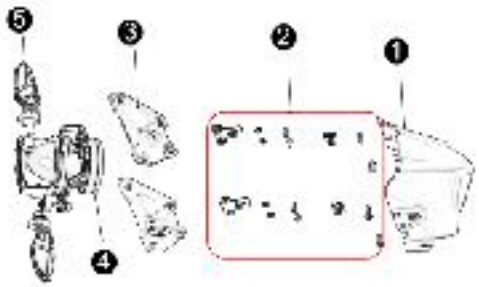


Fig 11

6.4.3 Disassemble front wheel assembly（Fig 12）

• Loosen bolts of wheel and axle of lower support of front absorber①

• Dismount fastening bolts of front wheel and axle, draw wheels and axles out and

dismount front wheel assembly

• Dismount bolts of front fender and lining② and front fender

6.4.3.1 Assembly

• Assemble front wheel assembly according to the inverse disassembly steps, fasten front wheel and axle with the torque force of 10~12N.m and bolts with the torque fore of 20-30N.m.

Notice: it is important to fasten fastening bolts of wheel and axle alternatively and repeated in order to disperse loads uniformly. Fastening the second bolt may cause the first bolt loose.

Ensure brake disk is between brake pads in assembly of front wheel. Otherwise, brake lining or brake disk may be damaged.

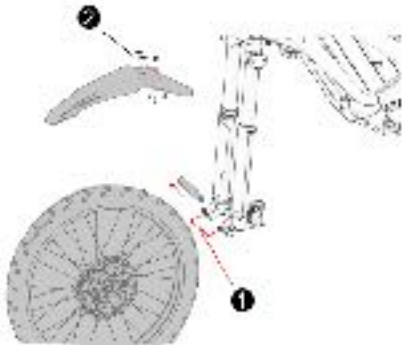


Fig 12

6.4.4.Dismount front brake disk (Fig 13, 14)

• place front wheel assembly flatwise with disk upwards. Clean and protect it.

• Dismount bolts of front brake disk①, take down front brake disk② and avoid contaminating brake disk

6.4.4.1 Assembly

• Assemble front brake disk according to the inverse disassembly steps, use thread locking glue (Loctite 243) on bolt, fasten it with the torque force of 8-10N.m. Pay attention to rotation and install direction of brake disk, avoid contaminating brake disk, use absolute ethyl alcohol in cleaning

• Ensure disk is at a correct position (see the following figure)

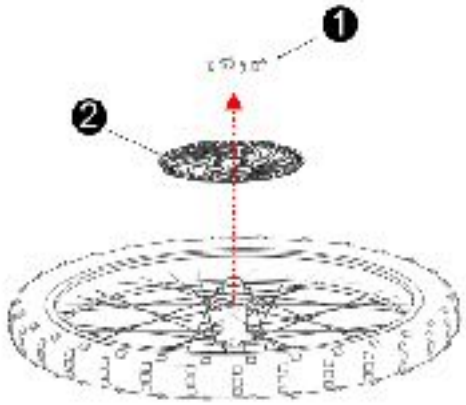


Fig 13

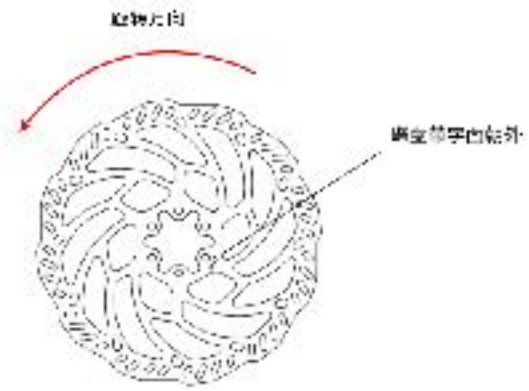


Fig 14

图注

6.4.5Dismount front absorber (see Fig 15)

• Dismount bolts of front brake caliper and take down front brake caliper③

• loosen bolts of front stanchion①from front absorber, take down steering limiting rubber bearing of absorber②, and take down front left and right absorbers

6.4.5.1Assembly

• Assemble front absorber according to the inverse disassembly steps and fasten it with the torque force of 10~12N.m.

Notice: it is important to fasten bolts of absorber alternatively and repeatedly in order to disperse loads uniformly. Fastening the second bolt can make the first bolt loose.

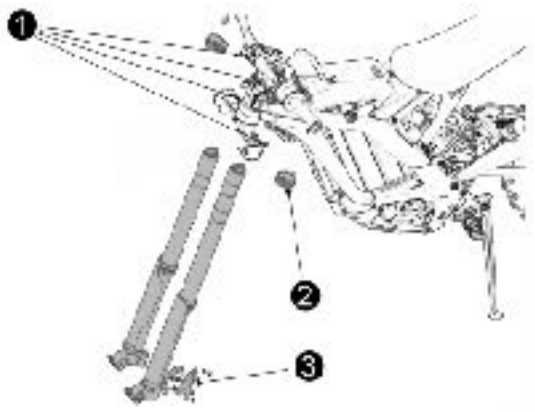


Fig 15

6.5 Dismount rear absorber and rocker arm (see Fig 16, 17)

Dismount rear absorber according to the following steps:

• Put LIGHT BEE QL3000DY on platform or support plat at bottom bracket area

• Loosen the bolts of connector at the upper part of absorber②: fix rear wheel make sure it not falls off and dismount bolts. Put the bike on floor.

• Loosen the bolts of connector at the lower part of absorber②

• dismount absorber②

• Dismount bolts of rocker arm and take down connecting rod of rocker arm④ and rocker arm⑤.

6.5.1 Assembly

• Assemble rear absorber and rocker arm according to the inverse disassembly steps. Fasten M8 bolt of absorber with the torque force of 25-30N.m.

Don't damage the paint on rocker arm and bike frame in disassembly and assembly of absorber.

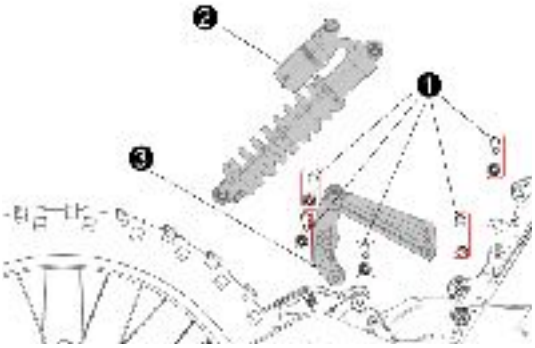
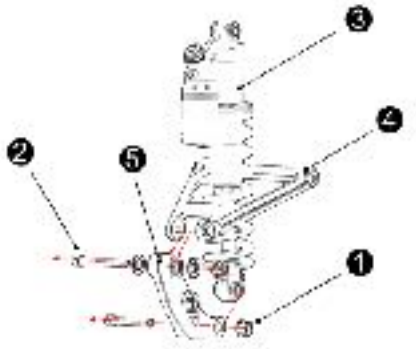


Fig 16



17Fig 17

6.6 Disassemble damping spring

Disassemble damping spring according to the following steps:

- Dismount absorber (see "6.5 dismount rear absorber")
- Unscrew preloaded adjustment nut to loosen spring.
- Dismount gasket of spring seat
- Dismount spring

6.6.1Assembly

- Assemble damping spring according to the inverse disassembly steps.

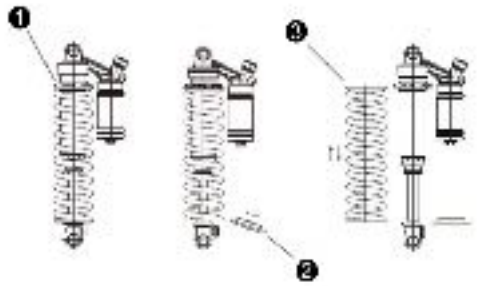


Fig 18

7. Check, disassemble and assemble head parts

7.1Check the stroke gap of head parts

Fig 15

If head parts have gap or steering position has resistance, check the tightness of bolt① of cover of head parts. The correct torque is 8-10N.m. Before adjusting the bolt, fasten the two fastening bolts between handlebar and stand pipe② and the fastening bolts on connecting plate③.

- If necessary, fasten or unscrew bolts. If the recommended torque can't be achieved by fastening, star nuts may be damaged. In the case, you must use new head parts.
- If head parts can't work normally (resistance in steering, gap or overhigh resistance) after the recommended torque is achieved by tightening, some parts on bearing may be damaged. In the case, you must use new head parts.

7.2 Disassemble head parts

Disassemble the head parts of Light Bee QL3000DY according to the following steps:

- Put Light Bee QL3000DY on support at bracket area
- Dismount front case and instrument (see "6.4.1 disassemble front case and instrument). Do not damage instrument connection line.
- Dismount front fender and front wheel (see "6.4.3dismount front wheel assembly")
- Dismount brake handle (see "separate brake handle from handlebar")
- Loosen locking bolts between handlebar and stand pipe of steering column (see Fig 16).
- Loosen locking bolts of upper and lower connecting plate of front absorber
- Dismount lower connecting plate and absorber assembly and ensure no parts missing
- Dismount bearing cover of hear parts
- Dismount star nuts. Install nuts inside stand pipe of steering column through pressure. Use M6 thread rod to push nuts out from above.

If any part is damaged when drawing out head parts, install new head parts to ensure the functional of system.

Fig 19

7.2.1 Assembly

• Assemble head parts according to the inverse disassembly steps and with the following torque values:

Important notice: fasten cover of head parts, upper connecting plate and clamp bolts between handlebar and steering column and locking bolt of absorber of upper connecting plate successively.

• Fasten upper connecting plate， handlebar and stand pipe of steering column using the M5 bolt withtorque of 8N.m.

front absorber M16 Locking bolt: 10-12N.m

Use special tool to pass new star nuts through the upper hole of stand pipe of steering column.

Be careful when inserting star nuts. If it is at a deeper position than the designed depth, locking bolts are not long enough to achieve proper fastening.

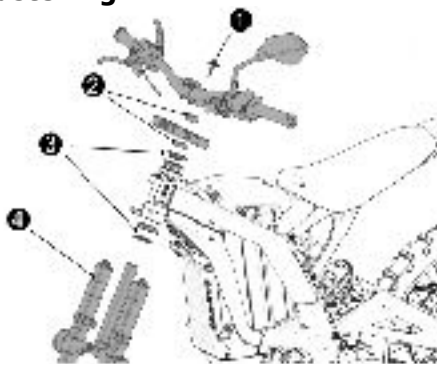


Fig 20

8 Disassemble and assemble handlebar assembly (Fig 21)

Disassemble head parts of Light Bee QL3000DY according to the following steps:

• Put Light Bee QL3000DY on support at bracket area

• Dismount left and right rearview mirror

• Dismount handle grips, throttle and switch. Do not damage switch line.

• Dismount upper pump of brake (see "dismount upper pump from handle bar")

• Dismount locking bolts between handlebar and handlegear tube (see Fig 16), take handle gear down

8.1.1 Assembly

• Assemble handlebar assembly with the following torque and according to the inverse disassembly steps:

• Fasten main pump of disk brake and M5 bolts between handlebar and handlebar tube with the torque of 8-10N.m.

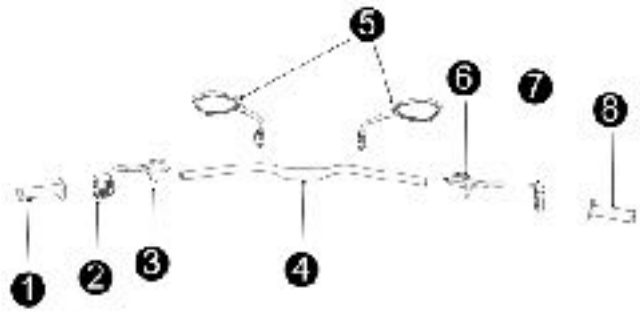


Fig 21

9. Check wheel

9.1 Check tire

9.1.1 Tire status

The height of sliding block of mud tire must be checked regularly. The acceptable minimum height is 2mm. If its height is lower than 2mm, must replace new tire.

9.1.2 Pressure

Tire pressure examination is aimed at cooled tires, so tires should not be used within a few hours before examination. The recommended pressure for front and rear wheels is 225KPa.

Inappropriate pressure or tire may cause:

- unexpected cracking
- lose control of bike
- low tire pressure causes increased rolling resistance
- reduce service time
- clamping and piercing

9.2 Check wheel rim

Deformation examination for wheel rim should be conducted according to the following steps:

• Put Light Bee QL3000DY on support at bracket area

• Confirm wheels rotate properly. Check whether wheels swing transversely (see Fig 22). If swing transversely occurred, measure their transverse motion through indicator. If transverse motion exceeds 1.5mm, check whether wheel rim is deformed or bearing is damaged. If wheel rim is in a good condition, check whether tire is installed on wheel rim correctly.

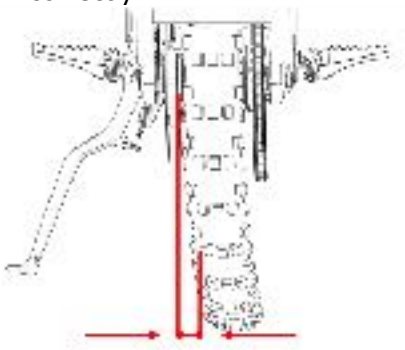


Fig 22

If wheel rim is in normal condition but the wheel rotate surface is not vertical to the ground (see Fig 23), bottom fork may be bended or installed incorrectly. Check bottom fork.

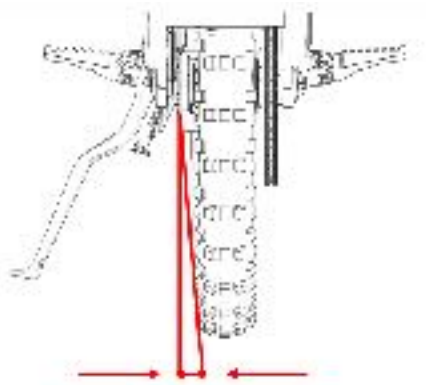


Fig 23

9.2.1 Tension of spoke of wheel

Ensure the tension of spoke of wheel is normal. Otherwise, bike may become unstable. Check whether spoke of wheel is tense. If any spoke of wheel is not tense, fasten them and check status of wheel rim and gap of wheel hub

10. Checking and maintenance of brake system

10.1 Check brake

10.1.1 Power examination

Before use, check whether the power and brake is normal. must feel the brake point. If there is no brake point at two thirds of stroke of brake handle, press brake handle repeatedly until it reaches brake disk.

Adjust the contact area of brake handle according to the indications in the following figure.

If brake point is not found at the starting point of stroke of brake handle, deflate brake system (see "10.2.1 deflate brake")

10.1.2 Check the status of flexible brake pipe

Check the length of all flexible brake pipes and accessories connect with brake handle and callipers to find any potential damage or fluid leakage.

10.1.3 Check brake pad

As shown in Fig 24, the thickness of brake pad is 2.5mm at least (including metal support). Replace the brake pads if the thickness is less than 2.5mm immediately.

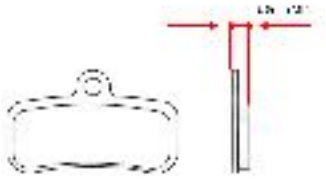


Fig 24

10.1.4 Check the thickness of brake disk

As shown in Fig 25, the thickness of brake disk is 1.6mm. Replace the brake disks if the thickness is less than 1.6mm immediately.

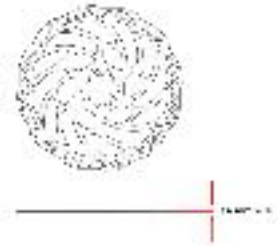


Fig 25

10.1.5 Check brake disk

Brake disk must be kept horizontal in order to ensure functional. Bended brake disk will make braking feeling irregular, worsen power and control of brake and accelerate the

wear of brake pad.

Put LIGHT BEE QL3000DY on central support. Rotate wheel and observe disk passing by pad to check whether disk has indentation or has been bended. If disk doesn't have friction with brake pad, slight transverse motion is acceptable. If disk has friction with brake pad at any point, replace it.

Don't touch the surface of disk or pad with bare hands, grease on your fingers may lower braking force.

Prevent oil or braking oil from touching disk or brake pad. If it happens, replace brake pad, dismount disk and clean them with isopropyl alcohol.

10.2 Maintenance

10.2.1 Deflate brake

Deflate the brake on LIGHT BEE QL3000DY according to the following steps:

• Arrange necessary tools for deflation:
  - short needle cylinder for pump
  - long needle cylinder for brake caliper
  - original brake mineral oil

Only original brake mineral oil is allowed in deflation. DOT brake fluid is banned in any condition.

• Switch the stroke adjustment device on brake handle to (+) position. (rotate adjustment device clockwise on right brake and rotate adjustment device anticlockwise on left brake at the same time)

• Dismount brake caliper from brake (see "dismount brake caliper"). Ensure that place brake caliper at a position lower than other line.

• Dismount brake pad (see "replace brake pad"). When it is used to fix the shock insulator of brake pad, fix piston on brake caliper in case that brake caliper bounces after pressing brake handle. Use rubber band to fix shock insulator.

• Fix brake caliper above brake pump (brake handle).

When there is no oil in long needle cylinder, lift brake caliper above brake pump and remove long needle cylinder from adapter.

• Dismount head bolts of brake caliper. Then, use long needle cylinder containing mineral oil into brake caliper and fasten it with an 8mm wrench.

• Fix brake handle at the angle of 45°

• Dismount deflation screw and prevent oil leakage. Remarks: the bolts are made of plastics. Be careful in operation in case of damages. Press short needle cylinder into the position of plastic bolts.

• Given the low position of brake caliper, the oil pumped from long needle cylinder flew out from the top of short needle cylinder.

• When all oil in long needle cylinder is pumped out, use long needle cylinder to pump the oil in oil line back. Repeat the process until there is no bubbles at the top (the position of brake pump).

• When there is no oil in long needle cylinder, lift brake caliper from brake pump and take long needle cylinder out with adapter.

• Put brake caliper down slowly. When oil flows out from the hole of brake caliper, put deflation screw back.

• Dampen brake caliper.

• Take needle cylinder down from brake pump carefully and place plastic bolts at the corresponding positions. (maximum torque is 40Nm, otherwise may damage the bolt).

• Dismount shock insulator of piston from brake caliper.
• Reinstall brake pad.
• Reinstall brake caliper on support of disk brake aligning to brake disk.
• Make sure system is functional.

10.2.2 Replace brake pad (see Fig 26)

Dismount brake pad according to the following steps:

• Dismount brake caliper (see "dismount brake caliper")
• Dismount pin bolts ①
• Dismount brake pad ②
• Push it out through piston

Install new pad according to the inverse disassembly steps. The torque tightening of safety bolt is 2.5N.m. After installing brake pad, press brake handle repeatedly until the contact point between brake pad and brake disk becomes stable.

After replacing brake pad, deflate brake caliper to obtain the maximum braking force if necessary.

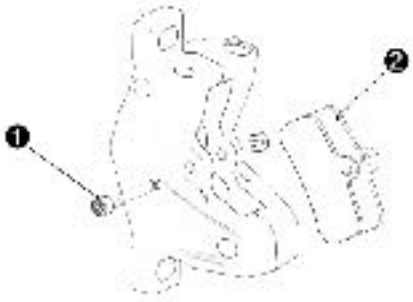


Fig 26

10.3 Dismount brake handle (see Fig 27)

Install brake handle on pump by pressing pull rod. Dismount brake handle according to the following steps:

• Fix pump firmly, press handle, dismount positioning bolts and screens gasket from pin axle. Push rod (A) down with the cylindrical tool with the diameter of less than that of pull rod. Pull rod may pulled out suddenly, be careful in operation.
• Dismount handle.

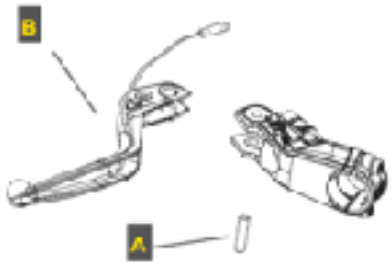


Fig 27

10.3.1 Assembly

• Assemble brake handle according to the inverse disassembly steps. Press handle to its original position with nylon hammer. Ensure spring is at a correct position.

10.4 Remove main pump of brake from handlebar (see Fig 28)

Remove main pump of brake according to the following steps:

• Dismount holder bolts (A).
• Dismount cover of holder (B).
• Dismount main pump of brake (C).

10.4.1 Assembly

Assemble main pump of brake according to the reverse disassembly steps. Fastening bolts with the torque force of 4Nm. Holder must be put at a correct position (arrow shown inside).

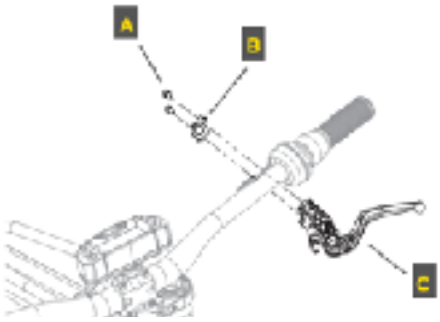


Fig 28

10.5 Dismount brake caliper (Fig 29)

Dismount brake caliper according to the following steps:

• Dismount bolts①

• Dismount brake caliper②

10.5.1Assembly

• Put LIGHT BEE QL3000DY on support at bracket area.

• Put brake caliper② at a correct position and fasten bolts①. Don't tighten the bolts for future adjustment of position of brake caliper. Use thread locking glue (Loctite 243) on bolts.

• Pinch brake handle slightly and rotate wheel. Target brake caliper with brake disk aligns correctly.

• Keep brake pressure handle still and fasten the bolts① on brake caliper with the torque force of 8-10Nm.

Fig 29

10.6 Dismount the adapter of brake caliper (only suitable for front brake caliper) (see Fig 30)

Dismount the adapter of brake caliper according to the following steps:

• Dismount brake caliper (see "dismount brake caliper")

• Dismount the bolts used to fix adapter①

• Dismount the adapter of brake caliper②

10.6.1 Assembly

• Assemble the adapter of brake caliper according to the inverse disassembly steps. Use thread locking glue (Loctite 243) on bolts and fasten bolts with the torque force of 8-10N.m.

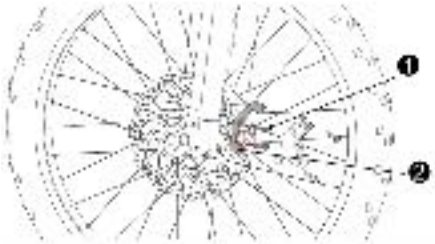


Fig 30

Important matters: check the assembly procedures of brake caliper (see "dismount brake caliper") to ensure that brake caliper aligns to disk.

10.7 Dismount front brake assembly

Dismount front brake assembly from LIGHT BEE QL3000DY according to the following steps:

- Dismount main pump of brake from handlebar (see "dismount main pump of brake from handlebar")
- Dismount front brake caliper (see "dismount brake caliper")
- Dismount pipe clamps of flexible brake pipe and brake assembly.
- Assemble brake system according to the inverse disassembly steps and deflate hydraulic system (see "deflate brake caliper").

10.8 Dismount rear brake assembly

Dismount rear brake assembly from LIGHT BEE QL3000DY according to the following steps:

- Dismount rear main pump of brake from handle bar (see "dismount main pump of brake from handlebar")
- Loosen rear flexible brake pipe from main pump of brake.
- Dismount flexible brake pipe
- Dismount pipe clamps of internal flexible brake pipe
- Pull flexible brake pipe off bike frame completely.
- Dismount rear brake caliper (see "dismount brake caliper")

Remarks: a few drops of brake fluid may flow out of flexible brake pipe during operation. The brake fluid in LIGHT BEE QL3000DY is mineral oil and nor corrosive. Brake fluid can be wiped with clean cloth.

Contacts machine oil may permanent damages brake pad.

10.8.1 Assembly

- Put flexible brake pipe near brake caliper on bike frame
- Install pipe clamps
- Place parts according to the following steps: rubber guard plate, nut, insertion piece and lubricating oil.
- Tighten flexible brake pipe and main pump of brake and ensure flexible brake pipe is not deformed. If flexible brake pipe is distortional, Loosen and correct it.
- Install rear brake caliper
- Install rear brake caliper
- Add brake fluid to the pipe (see "deflate brake")

Remarks: in the operation, tightening brake caliper and tightness of flexible brake pipe and main pump of brake are extremely key process, same as refueling and deflation. Please let professionals do the operation and be careful.

11 Disassemble and assemble bike

11.1 Dismount middle shaft bush (see Fig 31)

Dismount middle shaft bush from LIGHT BEE QL3000DY according to the following steps:

- Dismount rear wheel from bike (see "dismount rear wheel") and put it on workbench.
- Dismount rear fork from bike (see "dismount rear fork") and put it bushing on workbench.
- Dismount lining① of middle shaft bush, dismount belt wheel bolts② and chain wheel

bolts② with wrench

• Dismount belt wheel③ and small chain wheel

• Take oil seal of middle shaft bush down with special tool④

• Take bearing and internal lining of middle shaft bush down with special tools

11.1.1 Assembly

• Assemble middle shaft bush according to the inverse disassembly steps, apply lubricating grease on bearing, lining and oil seal. Use thread locking glue (Loctite 243) on bolts and fasten bolts with torque force of 10-12N.m.

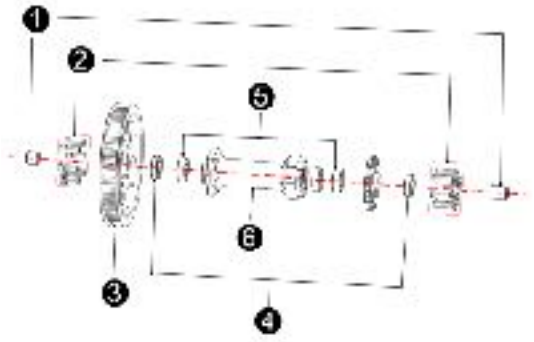


Fig 31

11.2 Dismount side cover of DC motor (see Fig 32)

Dismount side cover of DC motor from LIGHT BEE QL3000DY according to the following steps:

• Dismount fastening bolts① of side cover of DC motor and put them② on workbench.

11.2.1 Assembly

• Assemble side cover of DC motor according to the inverse disassembly steps. Fasten bolt with torque force 4-5N.m.

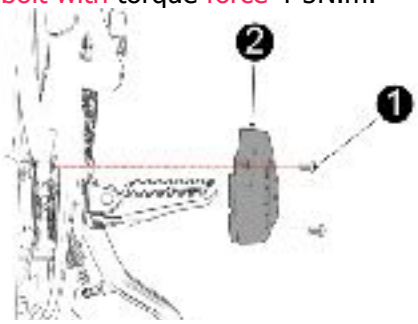


Fig 32

11.3 Disassemble side cover of DC motor (see Fig 33)

Dismount side cover of DC motor according to the following steps:

• Dismount screws of DC motor side cover③ on platform with tools and separate side cover parts ①②

11.3.1 Assembly

• Assemble side cover of DC motor according to the inverse disassembly steps.

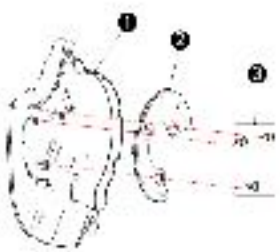


Fig 33

11.4 Disassemble and assemble first level transmission belt

Dismount first level transmission belt from LIGHT BEE QL3000DY according to the following steps:

• Dismount side cover of DC motor from bike (see "dismount side cover of DC motor")

• Loosen upper bolts of DC motor and loosen transmission belt tension (see "dismount DC motor assembly")

• Dismount rear fork assembly from bike (see "dismount rear fork assembly") and take first level transmission belt down.

11.4.1 Assembly

• Assemble first level transmission belt according to the inverse disassembly steps. Fasten bolts with torque force 25-35N.m.

11.5 Dismount left pedal assembly (see Fig 34)

Dismount left pedal assembly from LIGHT BEE QL3000DY according to the following steps:

• Put the base of bike down on platform with rear wheel suspended, lift side stand.

• Remove cable tie of side stand switching line and disconnect switching line③. Avoid damaging switching line.

• Dismount bolts of left pedal assembly① and left pedal assembly② from bike.

11.5.1 Assembly

• Assemble left pedal assembly according to the inverse disassembly steps. Tighten bolts with torque force 25-30N.m.

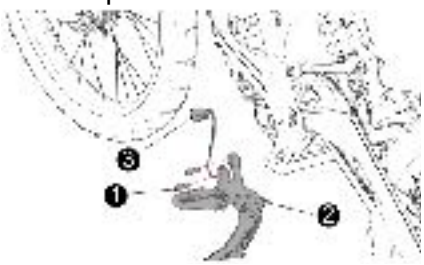


Fig 34

11.6 Disassemble left pedal assembly (see Fig 35)

Disassemble left pedal assembly according to the following steps:

• Use tools to disassemble spring of side stand③ on platform and avoid harms when disassemble spring.

• Dismount side stand stepped screw and separate side stand① and left pedal support②.

• Dismount switching sensor on the left pedal support, use special tools to take the magnet down from side stand.

• Dismount hanging hook of spring④ from side stand.

11.6.1 Assembly

• Assemble left pedal assembly according to the inverse disassembly steps.

avoid harms when disassemble spring. Apply lubricating grease on stepped screws in the assembly of side stand.

Fig 35

11.7 Dismount right pedal assembly (see Fig 36)

Dismount right pedal assembly from LIGHT BEE QL3000DY according to the following steps:

• Put base of bike down on platform with rear wheel suspended, lift side stand.
• Dismount bolts of right pedal assembly① and right pedal assembly② from bike.

11.7.1 Assembly

• Assemble right pedal assembly according to the inverse disassembly steps. Tighten bolt with torque force 25-30N.m.

Fig 36

11.8 Disassemble left pedal assembly (see Fig 37)

Disassemble left pedal assembly according to the following steps:

• Use tools to dismount pedal-linked pin on platform, take spring of pedal down and separate pedal① and adapter bracket of pedal②.

• Dismount stepped screws and separate adapter bracket of pedal② and pedal support③.

• Dismount switching sensor④ on left pedal support.

• Dismount hanging hook of spring ⑤ from left pedal support.

11.8.1 Assembly

• Assemble pedal assembly according to the inverse disassembly steps. Tighten adapter bracket of pedal with torque force 40-45N.m.

Fig 37

11.9 Dismount guard plate of DC motor (see Fig 38)

Dismount guard plate under DC motor according to the following steps:

• Put side stand down on floor to support bike stably.

• Dismount bolts① and thread holder② of guard plate and take guard plate down③.

11.9.1 Assembly

• Assemble guard plate of DC motor according to the inverse disassembly steps. Tighten bolts with torque force 20N.m.

Fig 38

11.10 Dismount guard plate of controller (See Fig 39)

Dismount guard plate under controller according to the following steps:

• Dismount guard plate under DC motor (see "dismount protective cover under DC

motor")

• Dismount bolts①② of guard plate, and take guard plate down③.

11.10.1 Assembly

• Assemble guard plate under controller according to the inverse disassembly steps. Tighten M6 bolts with torque force 5N.m.

Fig 39

11.11 Dismount air circuit breaker combination (see Fig 40)

Dismount air circuit breaker combination according to the following steps:

• Dismount power battery of bike (see "dismount power battery")

• Dismount control system of bike (see "dismount controller")

• Dismount bolts① of support of air circuit breaker combination③ and bolts② respectively, disconnect fall detection sensor and take air circuit breaker combination③ down.

11.11.1 Assembly

• Assemble air circuit breaker combination according to the inverse disassembly steps. Tighten M6 bolts with torque force 10N.m.

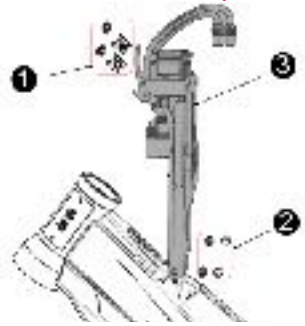


Fig 40

11.12 Disassemble air circuit breaker combination (see Fig 41)

Disassemble air circuit breaker combination according to the following steps:

• Dismount fall detection sensor support① and take down fall detection sensor. Avoid damaging the sensor wire.

• Dismount air circuit breaker fixing bolts, cut the cable tie that fixing the wires, take air circuit breaker②, nylon bushing and wire clamp down.

• Dismount front battery limitation support⑤.

• Take front buffer PE foam④ down from support③.

11.12.1 Assembly

• Assemble air circuit breaker combination according to the inverse disassembly steps. Tighten M6 bolts with torque force 10N.m. Generally, front buffer PE foam doesn't have to be replaced. It contains glue and cannot be reused. If you need to to replace it, stick it at last process.

Notice: fall detection sensor is assembled according to the arrows shown on protective jacket of sensor. Arrows must be upward. Otherwise, bike won't start.

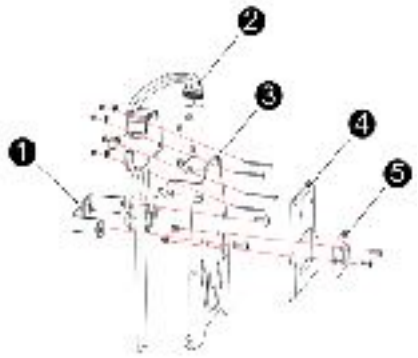


Fig 41

11.13 Dismount US and electric control lock combination (see Fig 42)

Dismount USB and electric control lock combination according to the following steps:

• Dismount bolts of USB and electric control lock cover①.

• Take USB and electric control lock combination② out from above. Avoid damaging electrical circuit and disconnect wires of USB and electric control lock.

11.13.1 Assembly

• Assemble USB and electric control lock combination according to the inverse disassembly steps. Tighten M6 bolts with torque force 5N.m

Fig 42

11.14 Disassemble USB and electric control lock (see Fig 32)

Dismount USB and electric control lock combination according to the following steps:

• Use tools to press limitation support of electric control lock, pull it upwards and take electric control lock out①.

• Dismount plastic nuts④ of USB, take USB② and waterproof plastic cap③ out.

11.14.1 Assembly

• Assemble USB and electric control lock according to the inverse disassembly steps. Avoid damaging plastic nuts.

Fig 43

11.15 Disassemble DC motor assembly (see Fig 44)

Dismount DC motor assembly according to the following steps:

• Put LIGHT BEE QL3000DY on support. Reinforce rear wheel. Suspend base at DC motor

area or use mobile lifting tool to support it.

• Dismount guard plate under DC motor of bike (see "dismount guard plate under DC motor")

• Dismount control system of bike (see "dismount controller")

• Dismount side cover of DC motor (see "dismount side cover of DC motor")

• Use lifting tool or hands to support DC motor⑨, dismount bolts⑤⑥ and ①⑦ successively and take lining, tensioner and gasket②③④⑧.

• Support and slightly move DC motor⑨, separate transmission belt and DC motor and take DC motor⑨ out.

11.15.1 Assembly

• Assemble DC motor assembly according to the inverse disassembly steps. Tighten M8 bolts with torque force 25N.m.

Notice: after combining belt and DC motor, install bolts①⑤⑥⑦ on belt and screw ① and ⑤ successively. Use tools to adjust tensioner to make belt tense until its elasticity can be felt with hands. In assembly, the height of bolts①⑤ should be kept consistent in order to make first level belt wheels parallel. Otherwise, belt may have abnormal sound.

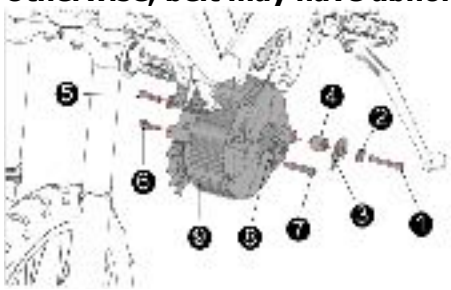


Fig 44

11.16 Dismount tailstock assembly (see Fig 45)

Dismount tail stock assembly according to the following steps:

• Put LIGHT BEE QL3000DY on support.

• Dismount rear fender inner plate (see "dismount rear fender inner plate"). disconnect taillight and GPS (if have), avoid damaging connection port.

• Dismount battery (see "dismount power battery")

• Dismount bolts from seat battery lock connecting support④ and bike frame⑥

• Dismount bolts of seat of battery lock cover①.

• Dismount left and right bolts②⑤ of tailstock and take tailstock assembly③ down.

11.16.1 Assembly

• Assemble tailstock assembly according to the inverse disassembly steps. Tighten M8 bolts with torque force 20N.m, tighten M6 bolts with torque force 8~10N.m.

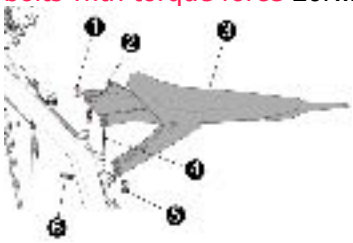


Fig 45

11.17 Disassemble tailstock assembly

Disassemble tailstock assembly according to the following steps:

• Put tailstock on platform.

• Dismount bolts of seat of battery lock cover and take seat of lock battery cover down③.

• Dismount bolts of seat cushion and take seat cushion down①.

• Dismount rear fender⑤ from seat cushion①.

• Dismount seat of battery lock② and separate connecting bracket④ from tailstock.

11.17.1 Assembly

• Assemble tailstock assembly according to the inverse disassembly steps. Tighten M6 seat cushion bolts with torque force 8~10N.m.

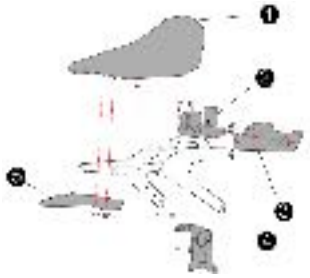


Fig 46

11.18 Dismount left and right limited blocks of battery (see Fig 47)

Dismount left and right limited blocks of battery according to the following steps:

• Dismount power battery (see "dismount battery")

• Dismount bolts of left and right limited blocks of battery① and take left and right limited blocks② down.

11.18.1 Assembly

• Assemble left and right limited blocks of battery according to the inverse disassembly steps.

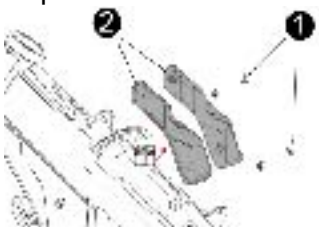


Fig 47

11.19 Dismount horn (see Fig 48)

Dismount horn according to the following steps:

• Dismount USB and electric control lock combination (see "dismount USB and electric control lock")

• Dismount bolts of horn①, disconnect electrical port of horn, avoid damaging electrical port of horn and take the horn② down.

11.19.1 Assembly

• Assemble horn according to the inverse disassembly steps. Tighten M6 bolts with torque force 8N.m.

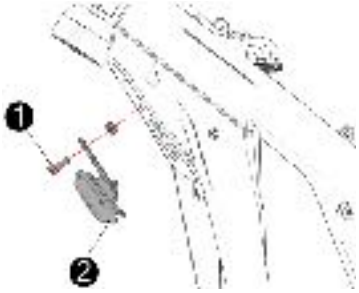


Fig 48

11.20 Dismount back shield of battery (see Fig 49)

Dismount back shield of battery according to the following steps:

• Dismount power battery (see "dismount battery")

• Dismount support connecting to seat of battery lock and bolts of bike frame (see "dismount tailstock assembly").

• Dismount four bolts① on back shield of battery, take small guard plate② and back shield of battery③ down.

11.20.1 Assembly

• Assemble back shield of battery according to the inverse disassembly steps.

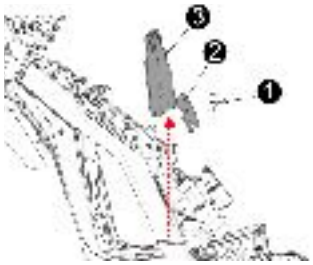


Fig 49

11.21 Dismount rear wheel assembly (see Fig 30)

Disassemble rear wheel assembly according to the following steps:

• Put LIGHT BEE QL3000DY on support at bottom bracket area

• Take out cable tie of rear fender taillight wire and disconnect taillight

• Dismount bolts of brake caliper of rear disk brake, take brake caliper of rear disk brake⑤ and put shock insulator (plastic piece with the thickness of 2mm) between brake pads

• adjust adjustment bolts of rear wheel, shorten bolts to take chains down, loosen shaft of rear wheel, take chains③ down (if adjustment bolt of rear wheel is not short enough, use tools to dismount clip of chain connector and disconnect chain), then, take shaft of rear wheel down

• Take rear fender assembly②, back wheel assembly④ and support of rear disk brake respectively.

In the disassembly and assembly of rear wheel assembly, avoid damaging the paint on bottom fork.

11.21.1 Assembly

• Assemble back wheel assembly according to the inverse disassembly steps and use torque wrench to fasten bolts:

• Bolts of rear brake caliper: 10N.m

• Nuts of rear wheel and axle: 55-60N.m

In the assembly of rear wheel, ensure disk is between brake pads. Otherwise, brake pad or disk may be damaged.

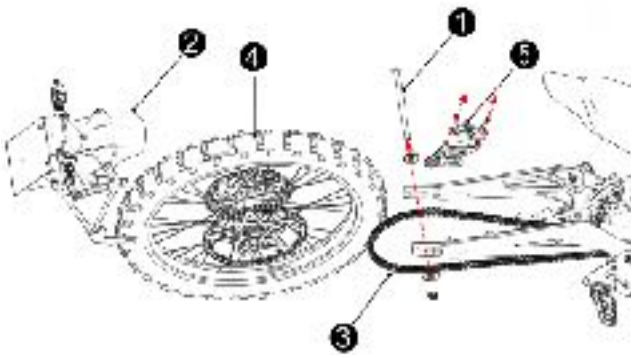


Fig 50

11.22 Disassemble rear wheel (see Fig 51)

Disassemble rear wheel according to the following steps:

- Put rear wheel assembly on workbench
- Take left and right linings①④ of rear wheel down, dismount bolts⑤ of rear brake disk, and take rear brake disk⑥ down (make sure the brake disk is clean and undamaged)
- Take bolts of rear chain wheel② and rear chain wheel③ down

In the disassembly and assembly of rear wheel, don't damage the paint on wheel disk and wheel hub, make sure the brake disk is clean and undamaged, avoid contaminating rear brake disk.

11.22.1 Assembly

- Assemble rear wheel according to the inverse disassembly steps and fasten bolts with torque wrench:
- Bolts of rear brake disk: 12N.m
- Bolts of chain wheel of rear wheel: 20-25N.m

Fig 51

11.23Dismount rear fork (see Fig 52)

Dismount rear fork according to the following steps:

- Dismount rear absorber, rocker arm, belt and chain of DC motor (refer to the disassembly method of rear absorber, rocker arm, belt and chain of DC motor)
- Dismount bolts of protect cover of middle shaft bush and take protect cover of middle shaft bush down
- Loosen nuts of shaft of rear fork and remove the nuts
- Use steering tool to push shaft of rear fork out and take rear fork shaft① down
- Move rear fork, take down rear fork② and middle shaft bush combination③ with transmission belt

11.23.1 Assembly

- Assemble rear fork according to the inverse disassembly steps and apply lubricating oil

on bearing and bushing.

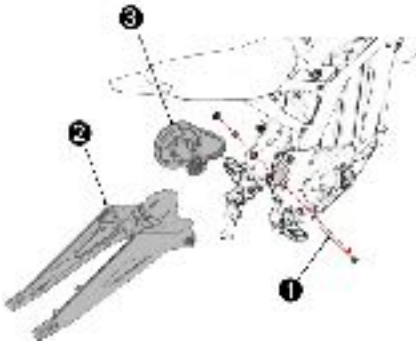


Fig 52

11.24 Disassemble rear fork (see Fig 53)

• Use special tools to dismount bearing of rear fork and remove isolation pad

11.24.1 Assembly

• Assemble bearing by applying pressure according to the inverse disassembly steps and apply lubricating oil on bearing and lining.

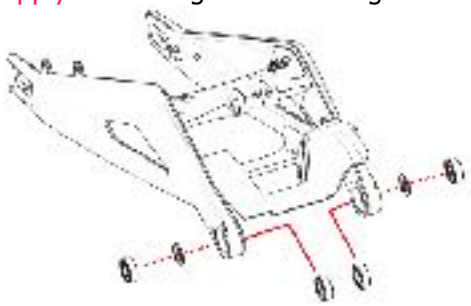


Fig 53

11.25 Disassemble rear fender assembly (see Fig 54)

Disassemble rear fender assembly according to the following steps:

• Dismount bolts of cover plate of taillight⑤, remove cover plate, disconnect port of taillight wire, take out cable tie of rear fender taillight wire and disconnect wire with rear fender

• Dismount bolts of rear fender⑥ and remove rear fender assembly.

• put it rear fender assembly on platform, dismount bolts of seat of taillight⑤ and take seat of taillight down.

• Dismount taillight②, turning light support① and rear license plate④ successively.

• Dismount turning light③ from turning light support①.

11.25.1 Assembly

• Assemble rear fender assembly according to the inverse disassembly steps.

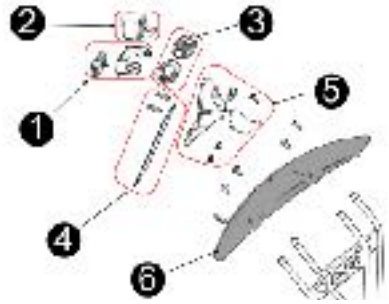


Fig 54

11.26 Disassemble rear fender inner plate (see Fig 55)

Disassemble rear fender inner plate according to the following steps:

• Use tools to dismount plastic screw① of rear fender inner plate and take rear fender

inner plate down②.

11.26.1 Assembly

• Assemble rear fender inner plate according to the inverse disassembly steps.

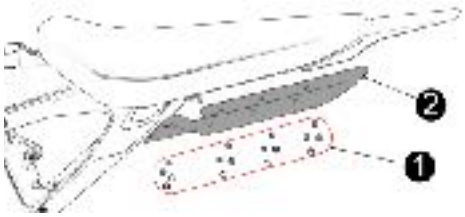


Fig 55

11.27 Disassemble and assemble cover of battery compartment (see Fig 56)

• Use keys to open cover of battery compartment. And use long flat nose pliers to take spring clip down from pin shaft ①② and draw pin shaft out①②

• Dismount cover of batter compartment

11.27.1 Assembly

• Assemble cover of battery compartment according to the inverse disassembly steps.

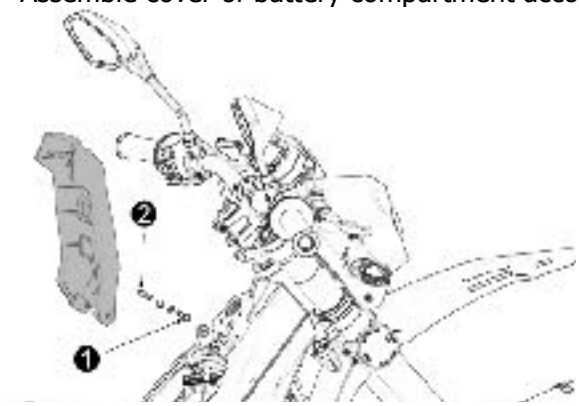


Fig 56

11.28 Dismount lower battery plate (see Fig 57)

Dismount lower battery plate according to the following steps:

• Dismount power battery (see "dismount battery")

• Dismount back shield of battery (see "dismount back shield of battery")

• Dismount DC motor (see "dismount DC motor assembly")

• Dismount bolts①② of lower battery plate, take throttle cable down, disconnect speed control device and power converter port. Take lower battery plate down.

11.28.1 Assembly

• Assemble lower battery plate according to the inverse disassembly steps.

Fig 57

11.29Disassemble lower battery plate (see Fig 58)

Disassemble lower battery plate according to the inverse disassembly steps:

• Use tools to take buffer PE foam① down on platform (if have)

• Dismount bolts② of lower battery holder③ and lower battery holder support④ to

separate ③ and ④.

• Dismount bolts⑤ of power converter and speed control device and take out power converter and speed control device⑥.

11.29.1 Assembly

• Assemble lower battery plate according to the inverse disassembly steps.

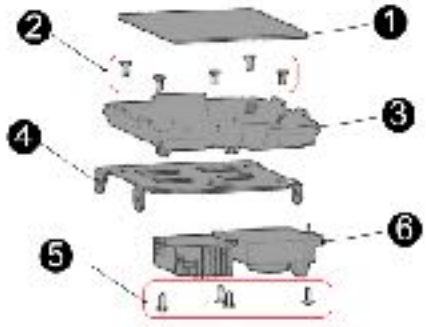


Fig 58

12. Checking and maintenance of speed control device and brake control device

12.1 Check brake

If brake works normally, regular checking brake is very important (see "checking and maintenance of brake"). Must check brake to cut off power system. Front and rear brakes both contain a sensor, When user pull brake handle, sensor will cut off the power immediately. Please follow the following steps to check whether system works normally.

Warning: be careful when LIGHT BEE QL3000DY accelerates on workbench. It can rotate freely, so it may accelerate suddenly. Keep chain and wheel away from support or any other static parts. Never touch wheel or drive system when bike is powered on.

• Put LIGHT BEE QL3000DY on a central workbench and turn on it.

• Operate a brake, twist handle of accelerator slightly. If rear wheel accelerates, that means system has faults. Check the other brake according to the above steps.

• If system has fault, check sensor and electrical connection of brake.

12.2 Check handle of accelerator (throttle)

• Accelerator only can be checked on bike. The operation conditions and rider's operation speed and lean angle must response immediately with accelerator, and power supply must proportional to accelerator position.

• If fail to response according to the operation, check electrical connection and perform diagnosis (refer to "electric diagnosis")

If the bike is not in operation, handle of accelerator must be at the stand-by position (no power). if it is not, adjust or replace handle of accelerator.

• Check power switch.

12.3 Confirmation of power supply control

The operation on power supply control must be checked through the test on bike. Power output should be locked or unlocked according to the provisions.

If it doesn't work normally, check electrical connection and make a diagnosis (refer to "electrical diagnosis").

13 Position adjustment

13.1 Adjust handlebar (see Fig 59)

Ensure handlebar is fixed firmly at the center of steerer tube. If is not, unscrew the four bolts of stem(A) of steerer tube, move it to the center and fasten M5 bolt equably. Adjust these bolts alternatively until torque reaches 5-6 N.m.

The angle of handlebar must be adjusted in order to make users feel comfortable and safe in riding. As you change the angle of handlebar, the position of control device and

brake handle will change and needs to be adjusted again. (see "adjust brake handle")

Fig 59

13.2 Adjust brake handle

Sit on the seat of bike and adjust brake handle with fingers. Adjust their angle to make them align to your arms when your fingers are on brake handle.

Adjust the position of brake on handlebar until users can pull the edge of brake handle with one or two fingers.

Adjust the range of brake handle with tools until users can reach handle easily with fingers.

After adjusting the position of brake handle, adjust the position of accelerator and shift lever in case of influencing brake.

14 Disassembly

14.1 Dismount handle of accelerator

Dismount handle of accelerator according to the following steps:

- dismount wire protector buckle
- cut off cable tie
- Loosen bolts of connector of accelerator
- release throttle cable
- Pull handle of accelerator out from handlebar

14.2 Dismount handlebar grip

Lift the edge of left handlebar grip and spray contract cleaner between handlebar grip and handlebar to dismount handle. Then, pull the handlebar grip out.

Before dismounting right handlebar grip, cut right handlebar grip open longitudinally carefully until it can be opened and dismounted.

Before installing a new handlebar grip, clean handlebar(left) or handle of accelerator(right), apply polyurethane adhesive on its surface and plug handlebar grip into its end.

14.3 Dismount throttle holder

Dismount throttle holder according to the following steps:

- Unscrew the bolts of throttle holder.
- Take throttle out from throttle holder and release throttle cable
- take throttle cable out from throttle holder
- Pull the throttle wire out.

14.3.1 Install hand-held shift lever

- pass throttle wire through shell of throttle holder and screw throttle holder shell and threaded rod of throttle cable
- Pull core of throttle cable out and plug handlebar into handlebar grip
- Connect core of throttle wire to handle of throttle. Cover handlebar with throttle holder and handle of throttle.
- Rotate throttle slightly until it moves and bounces back normally and smoothly.
- Screw throttle holder shell of A and B together with bolts. When tightening the bolts, adjust the angle of throttle holder to ensure no object will influence the motion of brake handle.
- Operate throttle to make sure it moves normally.

15. Transmission gear

15.1 Check chain and chain wheel

15.1.1 Check chain wheel

Check the wear of front chain ring and strap. Fig 60 shows the shape of normal gear teeth and damaged gear teeth. (good condition/bad condition). if it is in bad condition, replace it.

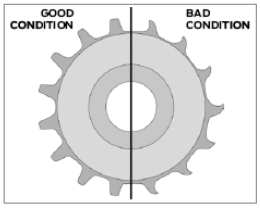


Fig 60

15.1.2 Check chain

Check the state of chain regularly. Pull chain as shown in Fig 61. If any broken tooth is found at the step, replace chain. Swing chain as shown in Fig 62 and ensure the vertical oscillating quantity of chain is 10-15mm. If the vertical oscillating quantity of chain is not between 10-15mm, adjust the tension degree of chain timely. If the adjustment limit of rear wheel of bottom fork is exceeded, suggest to replace chain (see "dismount chain").

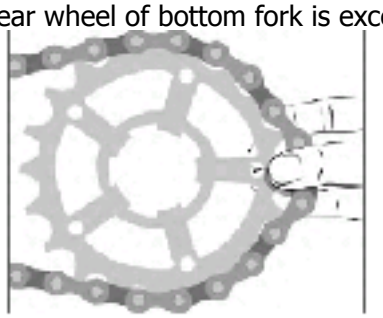


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Fig 61

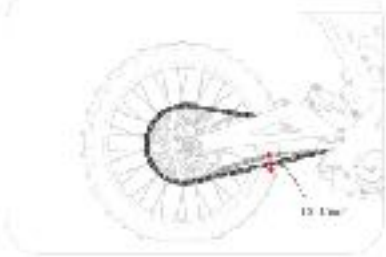


Fig 62

15.2 Clean and lubricate chain

Clean chains after use every time. It is very important to apply special chain oil to keep chains lubricated.

15.2.1 Lubrication of chain

Lubricate LIGHT BEE according to the following steps (see Fig 63):

Arrange the following objects:

- One barrel with hot water and soap.
- One big brush.
- One small brush.
- Defatted cleaner.
- chain oil of motorcycle.
- one piece of duster cloth without traces of fabric

• put LIGHT BEE QL3000DY on central workbench

• Clean chains with big brush and plenty of soap water and wash brush frequently.

• Clean chains of rear wheel and apply defatted cleaner on the chains. Then, clean

chains with duster cloth.

• Apply a handful of chain oil of motorcycle on chains.do not exceed certain amount of chain oil, make sure the chain is not soaked in oil. Rotate rear wheel forwards to make all chains touch chain oil. Avoid contaminating brake system when applying chain oil.

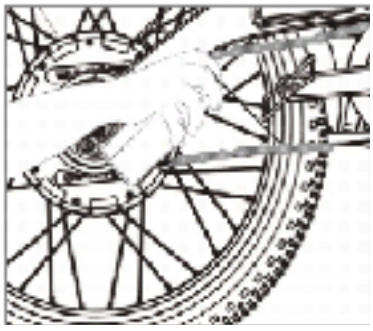


Fig 63

15.3 Dismount chains

LIGHT BEE QL3000DY has 420 chains, which is a fast and simple transmission system (see Fig 64).

Dismount chains from LIGHT BEE QL3000DY according to the following steps:

• Put LIGHT BEE QL3000DY on the central of workbench

• Adjust the position of rear wheel until reach minimum wheel axel-fork distance (rear wheel axel is closest to bottom fork) and loose chain reaches minimum tension.

• Look for chain connector and rotate rear wheel until chain connector is below rear fork(A)

• Push chain lock-up clip① with tools as shown in the following figure. Take lock-up clip① and connecting plate② down successively. And push connector③ out from one side. You may need some long flat nose pliers in the process.

Fig 64

15.3.1 Install chains (see Fig 65)

Install chains according to the inverse of dismounting steps. After chain return their original positions, make sure chain to fit the chain plate. Adjust chains adjustment bolts. Adjust the tension of chains by adjusting the position of rear wheel. Ensure the vertical oscillating quantity is between 10-15mm

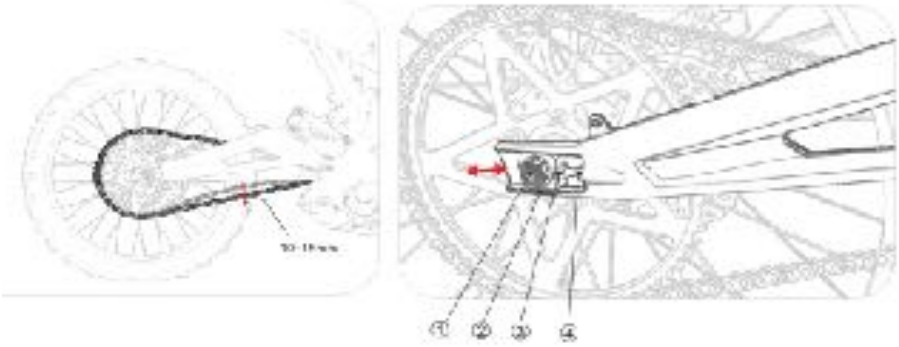


Fig 65

During installation, the open end direction of chain lock-up clip is contrary to the movement direction of chain.

16. Electrical system

16.1 Electrical systematic drawing of bike

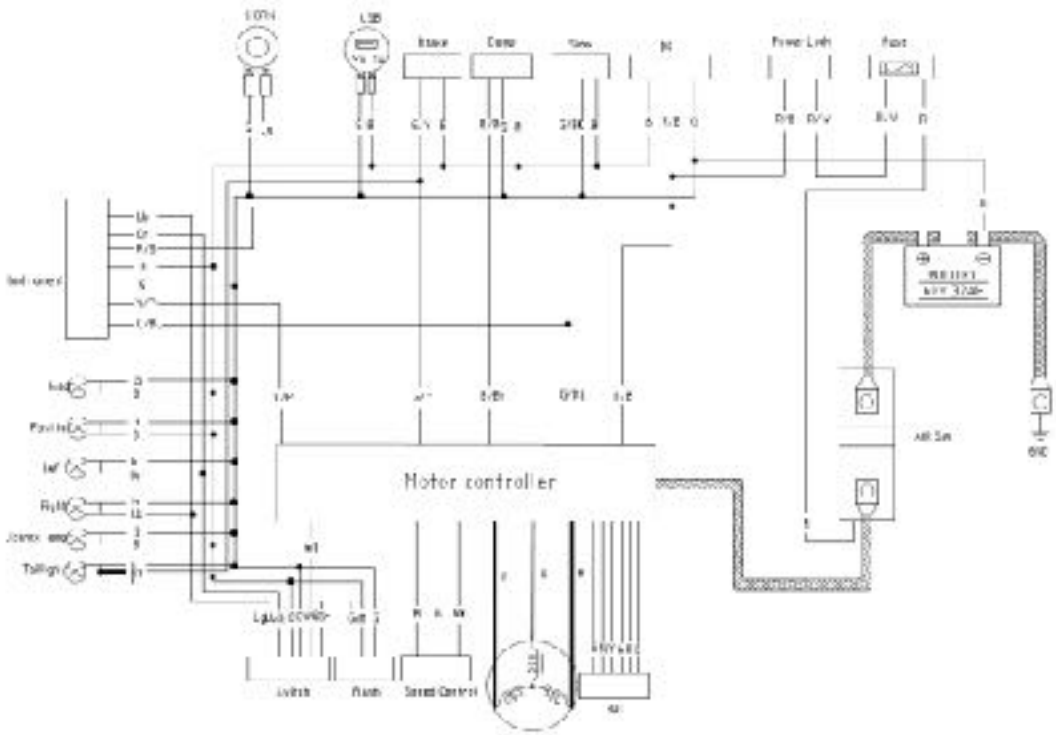


Fig 66

16.2Check electrical system

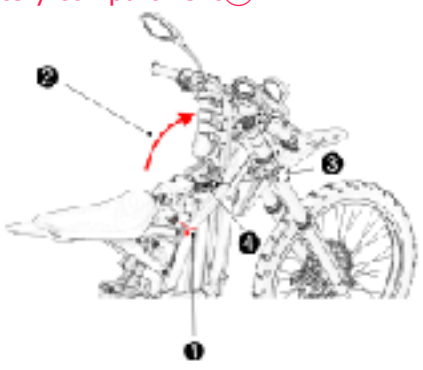
Users must check the state of connectors of battery, controller and other port of bike, especially the largely exposed or frequently operated parts.

Before any operation on the electrical system of LIGHT BEE QL3000DY, cut off power or stop other operations in case of damaging electrical elements.

17. Use and maintenance of battery

17.1. Disassembly and assembly of battery (see Fig 67)

17.1.1 Plug key into① battery compartment, then turn key anticlockwise to open cover of battery compartment②



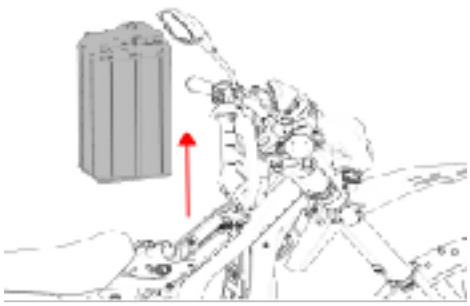


Fig 67 Fig 68

Cut off air circuit breaker, power source and disconnect power line and signal line of battery③, ④

Hold the lifting handle of battery and take the battery out (see Fig 68)

17.1.2 Assembly of battery

• Assemble battery according to the inverse disassembly steps.

17.2Maintenance and storage of battery

Check electricity display of battery regularly. Charge the battery if the electric capacity of battery is lower than 20%. If battery won't be used for long, charge it until its electric capacity reaches about 60% and close the air circuit breaker of bike. Charge the battery every three months in case of inactivating battery and influencing its performance and service life.

User cannot dismount battery by themselves in case of damages and dangers. Don't throw LIGHT BEE QL3000DY battery away in any case. If your battery needs to be replaced or discarded, send it to the designated dealers or after-sale service providers for appropriate handling.

Remember that many factors will influence the service life of battery. These factors will change greatly with service conditions and intensity.

17.3 Charging of battery

The battery can only be charged with special lithium battery charger in order to avoid damaging battery or dangers.

Check whether the input voltage of charger is same with the voltage of power grid AC110V/220V. Plug the power source into socket of battery at the left of bike or charge battery directly.

The silver colored socket at the left of lithium battery is charge socket. When charging the battery, plug output power plug first then input plug after. (Fig 69)

Fig 69

After battery has experience discharge protection, activate it through the following ways.

Step 1: connect output end of charger to input port of battery and connect input plug of charger to AC power grid. Then, the indicator of charger turns red and green alternatively;

Step 2: after "pull-plug" input plug of charger once, the indicator of charger turns red and green alternatively rapidly (time interval: 0.5 second) which lasts for 20 seconds;

Step 3: after 20 seconds, the red indicator of charger is on for 10 seconds. During this

10 seconds, "pull-plug" the input plug of charger once;
Step 4: at the moment, the function of "forced charging" starts, charger enters the procedures of normal charging and the red indicator of charger flash slowly (time interval one second)
Remarks:
a、don't "pull-plug" input plug of charger during 20 seconds in step 2. Otherwise, restart step 1 again;
b、"pull-plug" input plug of charger in step 3 needs to be finished in 10 seconds when red indicator is on. Otherwise, restart step 1.

State of charging indicator of charger

state of indicator	red indicator flash	green indicator is on	red indicator and green indicator flash alternatively
state of charger	charging	finished	charging fault

About charging

Keep charging bike away from children.
Don't use bike until 10 minutes after charging is just finished.
Don't put any object on the charger. The charger must use in dry and well-ventilated room.
If you smell unpleasant odor or find overtemperature in charging or indicator has not displayed fully charged after long time charge, please stop charging immediately and take it to check and repair.

18 Checking and maintenance of controller

18.1 Disassembly of controller (see Fig 70)
Take controller down from LIGHT BEE according to the following steps:
• Turn off and disconnect air circuit breaker.
• Disconnect battery.
• Dismount guard plate of DC motor (see "guard plate under DC motor")
• Dismount guard plate① under controller (see "dismount guard plate under controller")
• Dismount bolts② of cover plate on controller and take out cover plate and wire holder.
• Dismount bolts of controller③④, pull controller forwards to separate controller from bike. Be careful of connecting wires of controller.
• Disconnect electrical port of controller and dismount power source bolts⑤ of controller and take controller⑥ out.

18.1.1Assembly of controller
• Assemble controller according to the inverse disassembly steps. Tighten bolts with torque force 8-10N.m.

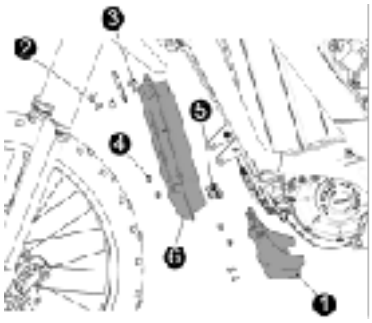


Fig. 70

Remarks: the bolts of input line and output line of power source of controller must be tightened according to the required torque. Because binding post and circuit board adopt electrical welding process, excessively high tightening torque will damage binding post of controller and lead to the breakdown of binding post.

Warning:

•Input line and output line of power source must be same with the symbols on controller. Red line on positive pole of power source is connected to "+" of controller. Black line on negative pole of power source is connected to "-" of controller. The output end of controller is connected to phase line of DC motor. "Y" end is connected to yellow line of DC motor. "G" end is connected to green line of DC motor. "B" end is connected to blue line of DC motor. Otherwise, controller will be damaged or cannot start properly.

•Before start the above work, disconnect air circuit breaker and power source or take battery down.

18.2Checking of controller

Check the wire of controller regularly make sure the wire is not loose and still insulating.

19、Electrical failure diagnosis and troubleshooting

Refer to the following table or failure diagnosis content for electrical failure checking and troubleshooting of bike.

fault	possible reason	method	solution
	battery is not installed in bike or power line is not plugged into battery	check plug of battery	install battery and plugged in
	air circuit breaker in front of battery has not been opened	check air circuit breaker	turn on air circuit breaker
	low battery protection of battery	turn off air circuit breaker, use multimeter to check whether output voltage of battery is normal (DC45V-67.2V)	charge battery
	battery enters low-temperature protection or high-temperature protection	check whether ambient temperature is lower than -20℃ or battery temperature is too high	charge it after ambient temperature becomes suitable (-20℃-70℃）
	protective tube of main cable is fused	check state of protective tube	replace protective tube

bike has no power after turn on the power key	plug of electric lock has not connecting properly	use multimeter to check whether electric lock is connecting properly	Re-plug to make sure it is well connected or replace new electric lock
	converter is damaged	Use multimeter to check whether the output is DC12V	replace new converter
	short-circuit protection of battery output	turning on or off air circuit breaker, use multimeter to check whether the output voltage of battery is DC45V-67.2V. If voltage is tested when air circuit breaker is turned off and voltage isn't tested when air circuit breaker is turned on, that means output has short circuit	If bike is powered on after dismounting positive pole line and negative pole line of controller, that means controller has short circuit. Replace controller
	battery is damaged	turn off air circuit breaker, use multimeter to check the output voltage is DC45V-67.2V. if the above problem can't be solved by charging with charger, that means battery is damaged	repair or replace battery at the designated shop
	switch protection of side stand	lift side stand up	lift side stand up
	brake to cut off power system	disconnect plug of brake to cut off power system	After confirming the position of braking point of handle, adjust the position of brake to cut off power system switch
	Fall detection protection is trigged and not reset	after righting bike, turn off and turn on key	after righting bike, turn off and turn on key
	throttle is not return to its original position	check free stroke of throttle cable	adjust free stroke
	low battery protection of battery	check electric capacity of battery	charge battery
	over-temperature protection of DC motor	whether after long-time riding with heavy loads	use bike after DC motor cooled down

bike has power but DC motor is not working after turn on the power key	over-temperature protection of controller	whether after long-time riding with heavy loads	use bike after controller cooled down
	switch of side stand is damaged	disconnect switch plug of side stand	disconnect switch plug of side stand or replace switch of side stand
	brake to cut off power system is damaged	disconnect plug of switch line of brake	disconnect switch plug of brake or replace switch of brake
	fall detection sensor is damaged	disconnect plug of fall detection sensor	disconnect plug of fall detection sensor or replace fall detection sensor
	speed controller has bad connection or been damaged	twist throttle, use multimeter to check the signal output voltage of speed controller (black and white line, green and white line) changes between 0.8V and 3.4V.	replace speed controller
	plug of controller has bad connection	pull and plug again to check whether terminal is normal	insert and pull the controller plug
	Plug of Hoare line of DC motor has bad connection	pull and plug again to check whether terminal is normal	insert and pull Hoare plug of DC motor
	fault of controller or Hoare fault of DC motor	use multimeter to check whether the voltage of Hoare line of DC motor is 4.2V;the voltage of red line and black line is 4.2 V. if voltage is abnormal, that signal output voltage of controller has failure	Replace controller
		When rear wheel is at different positions, use multimeter to check whether the voltage of Hoare line of electrical line is normal: The voltage of yellow line, green line and blue line for black line are respectively 0V or 4.2V. if voltage is abnormal, that means Hoare line of DC motor is malfunction	replace DC motor

bike has power but battery is not display capacity after turn on the power key	plug of electricity meter is loose		repair or replace battery in the designated after-sale shop
	electricity meter is damaged		repair or replace battery at the designated after-sale shop
charger doesn't work	discharge protection of battery	check the remaining electric capacity of battery. If electricity meter doesn't display, battery may enter protection mode because of low electric capacity	refer to battery charging and activation procedures
	battery temperature is too low or too high	when the temperature is lower than 0℃ or higher than 60℃, battery cannot be charged	charge it after charger temperature becomes suitable
	plug of charger has bad connection	check plug of charger	insert and pull of charging plug
	charger is damaged	if bike still can't be charged after the above troubleshooting, that means charger is malfunction	replace charger
	battery is damaged	if bike still can't be charged after replacing charger, that means battery is malfunction	replace battery
power mode is invalid or lack of power	battery is too low	check electric capacity of battery	charge or replace battery
	temperature of DC motor or controller is too high	controller enters power reduction mode	wait for DC motor or controller cooled down
	power mode switch is damaged	check whether power mode switch is functional with multimeter	replace power mode switch
DC motor has cut	brake to cut off power system adjusted inappropriately	disconnect brake to cut off power system plug	After confirming the position of braking point of handle, adjust the position of brake to cut off power system switch

off power during bumpy road	bumpy leads to the protection of controller	turn off key and turn on key	turn off key and turn on key
	bumpy makes plug loose	insert and pull plug and check whether terminal is functional	replace plug or terminal inside plug
USB doesn't working	USB plug is loose	check USB plug	insert and pull USB plug
	USB converter is damaged	check whether the voltage of input plug of USB is normal with multimeter	replace USB converter
speed is not displayed correctly	wrong setting of km/mile	reset status of km/mile	reset state of km/mile
	modification of gear ratio or transmission ratio leads to changes speed ratio	check gear ratio and transmission ratio	restore original gear ratio and transmission ratio
the speed on instrument display doesn't change	plug of instrument has bad connection	insert and pull plug and check whether terminal is functional	replace plug or terminal inside plug
	speed signal of controller doesn't have output	check speed signal of controller output voltage with multimeter	replace controller
	instrument is damaged	check whether the input signal of instrument is functional with multimeter	replace instrument
Display instrument not working after turn on the power key	plug of display instrument has bad connection	insert and pull plug of instrument and check whether terminal is functional	replace plug or terminal inside plug
	Display instrument is damaged	check whether the input line of instrument is functional with multimeter	replace instrument
lights not working after turn on the power key	plug of line of lights has bad connection	insert and pull plug and check terminal is functional	replace plug or terminal inside plug
	lights is damaged	check whether the input voltage of light is 12V with multimeter	replace light
horn not	plug of horn is loose	insert and pull plug and check whether terminal is functional	replace plug of input line of horn

horn not working after turn on the power key	push button of horn is damaged	check whether push button of horn is functional with multimeter	replace push button on left handlebar
	horn doesn't work	press push button of horn. Check whether the voltage on plug of horn is 12V with multimeter	replace horn

20 Failure diagnosis

Electrical failure diagnosis of bike is achieved through failure code on display instrument. When battery and controller of electric system of bike have failure, yellow indicator on instrument turned on and LCD displays the corresponding failure code, as shown in Fig 71.

Failure codes and corresponding definition of failure are shown in the following table:

failure code	definition	solution
Er-102	battery MOS temperature sensor malfunction	repair or replace battery at designated after-sale shop
Er-103	battery soft start failure	repair or replace battery at designated after-sale shop
Er-105	battery primary over-discharge protection	charge battery
Er-106	battery charge MOS damaged	repair or replace battery at designated after-sale shop
Er-107	batter discharge MOS damaged	repair or replace battery at designated after-sale shop
Er-114	battery low-temperature protection	use it after battery temperature becomes suitable
Er-116	battery over-temperature protection	use it after battery temperature becomes suitable
Er-117	battery over-temperature alarm	use it after battery temperature becomes suitable

Er-118	battery low-temperature alarm	use it after battery temperature becomes suitable
Er-119	battery primary over-discharge alarm	charge battery
Er-120	Battery MOS over-temperature alarm	use it after battery temperature becomes suitable
Er-201	controller over-temperature protection	use it after controller temperature becomes suitable
Er-202	controller power reduction cause by over-temperature	use it after controller temperature becomes suitable
Er-204	Hoare failure of controller	check plug of Hoare line or replace DC motor
Er-205	controller loose phase protection	check connection of controller or replace controller
Er-206	Controller software overcurrent protection	check connection of controller or replace controller
Er-207	controller hardware overcurrent protection	check connection of controller or replace controller
Er-208	power tube failure of controller	replace controller
Er-209	controller current sampling failure	replace controller
Er-211	Throttle to controller signal wire short-circuit	check wire of speed controller or replace speed controller
Er-212	controller rush-out protection	check free stroke of throttle cable
Er-213	controller low voltage protection	charge battery
Er-215	DC motor over-temperature protection	use it after temperature of DC motor becomes suitable
Er-216	DC motor power reduction cause by over-temperature	use it after temperature of DC motor becomes suitable
Er-217	battery 485 communication failure	check 485 communication line
Er-218	Low battery SOC capacity	charge battery
Er-219	Battery power reduction cause by over-temperature	use it after battery temperature becomes suitable
Er-221	Battery power reduction cause by low voltage	charge battery
Er-222	Key power down failure	Check key power source

Er-223	Fall detection protection	turn off key and turn on key after righting bike
Er-224	power-off protection of side stand	lift side stand or disconnect switch plug of side stand