

Trouble Shooting

1. The power light doesn't illuminate and the scooter doesn't run

- 1) The output voltage is less than $35\text{ V} \pm 1.0\text{ V}$
Use the multimeter to test the batteries for the voltage, if the voltage is too low, charge the battery.
- 2) The battery connections are loose.
Check and tighten all connections.
- 3) The ignition switch is broken.
Replace it.
- 4) The connections to close the electric circuit are loose. The connection from the control unit and motor is loose (check connector).
Tighten connections and repair plug connections.
- 5) The batteries life is overtime
Change the batteries
- 6) The batteries can not be charged.
Use the multimeter to test the charging point (See the picture) the red pen and the black pen should be connect correct, It should not have the “—” before the numbers showing on the multimeter, e.g. “48.1V” should not be “—48.1”, if “—48.1” appears, that is to say the anode and the cathode must be wrongly connected. In that case, if charging, the charger will damaged by a short circuit.



2. The power light is on and the scooter doesn't run.

- 1) The connection between the control unit and the batteries is loose.
Check the connection between batteries and the controller.
- 2) The motor is not getting a signal.
See Checking the Control Unit.
 - a) The circuit in the control unit is open.
See Checking the Control Unit.
 - b) The throttle handle is broken.
Replace it.
 - c) The cabling from the throttle handle is loose.
Repair or replace it.
 - d) The connector between the throttle handle and control unit is loose.
Check and tighten the plug or wires.
- 3) The switch for cutting the power when braking doesn't work.
Readjust the brake lever or replace the switch if needed.
- 4) The copper coil in the motor is open, has a short circuit, or the Hall Effect is defective
Replace the motor
- 5) The output voltage of the signal from the control unit is less than $6\text{ V} \pm 0.3\text{V}$.
Replace the control unit.
- 6) The side stand is folded out.
Fold it in.
- 7) The alternating current from the throttle handle is not between 1 V and 5 V.
Replace throttle handle.

8). No input voltage of the controller power, the line which connects the batteries and the controller is broken or the main relays don't work

- a) The batteries are charging
Stop charging
- b) The charging box was not connected well
Reconnect
- c) The charging box is broken
Change the charging box
- d) The side stand switch is broken
Change the side stand switch

3. The motor runs slowly.

1) The throttle handle is not mounted properly or the connections are loose.

Adjust it or replace the throttle handle if necessary.

Use the multimeter to test the red, black and the green lines, when there is a 5-6V between the black and the red lines, adjust the throttle to the maximal. Then test the black and the green lines, if the voltage shows than 5V that throttle handle is broken.



2) The batteries are not charged enough.

Charge the batteries or see Checking the Control Box.

3) The motor is defective.

Replace the motor

4) The control unit is defective.

Replace the control unit.

When creepage current happens and if this is out of the throttle handle's question because the throttle is already adjusted to the maximum, the motor still runs slowly, it must be the controller problem. Please change the controller.

4. The motor runs unevenly.

1) The batteries are not charged enough.

Charge the batteries or see Checking the Control Box.

2) The battery connections are loose.

Tighten them.

3) The throttle handle is not mounted properly or the connections are loose. The throttle handle is broken.

Reinstall it or check the cabling; possibly replace the throttle handle.

4) The switch for cutting power when braking doesn't work.

Readjust or replace the switch if need be.

5) The ignition switch is broken or the cabling is loose.

Check the cabling and replace the ignition switch if necessary.

6) The alternating current from the throttle handle is not between 1 V and 5 V.

- Replace throttle handle.
- 7) The cable connections between the batteries, motor, and control unit are loose.
Tighten connections and repair plug connections.
- 8) The control unit has a defective solder joint.
Replace the control unit.
- 9) The Hall Effect from the motor doesn't work.
Replace the motor.
- 10) The side stand switch doesn't work because of bad connection of the relay
Check the plug or change the side stand switch or change the side stand spring
- 11) The motor plug doesn't connect well
Reconnect

5. The main switch is on and the motor runs quickly, out of control.

- 1) The black line which connect the throttle handle and the controller is not connected well
Reconnect or change the throttle handle
- 2) The components or the circuit is broken
Change the controller

6. The range is too short.

- 1) The batteries are not fully charged.
Charge the batteries or see Checking the Control Box.
- 2) The batteries are defective.
Replace the batteries.
- 3). Check the charging control box and relays (48 V/100 A).
See Checking the Control Box and Relays.
- 4.) The Scooter is running on 4 batteries, only
Check the batteries connections and the relays connections (48 V/100 A)

7. The batteries don't charge or don't charge completely.

- 1) The batteries are defective.
Replace the batteries.
- 2) There is no output from the charger.
Replace the charger.
- 3) The output voltage from the charger is too low.
Replace the charger.
- 4) The power plug has not been put into the respectable properly.
Plug it in again.
- 5) The connection from the charger and scooter are loose or poorly connected.
Plug them in again.

8. The power light is not on but the scooter runs.

- 1) The speedometer cable connection is loose.
Tighten it and check the connectors.
- 2) The LED is broken.
Replace the LED.
- 3) The speedometer unit is broken.
Replace the speedometer unit.

9. The battery level display is incorrect but the scooter runs normally.

- 1) The LED is broken.

- Replace the LED.
- 2) The speedometer unit is broken.
Replace the speedometer unit.
- 3) The speedometer cable connection is loose.
Tighten it and check the connectors.

10. The horn doesn't work.

- 1) The horn switch is defective.
Replace the switch.
- 2) The horn is defective.
Replace the horn.
- 3) The cabling is loose.
Tighten it and check the connectors.
- 4) The transform switch is broken or the connector is loose.
Check the connector and replace the transform switch if necessary.

- a) Use the multimeter to test the two connecting sides of the horn



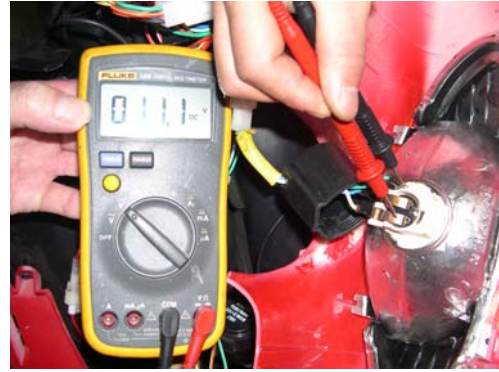
- b) Turn on the main switch, press the horn button, if the output voltage is 12V, the horn doesn't work, that is to say the horn is broken, should change the horn.



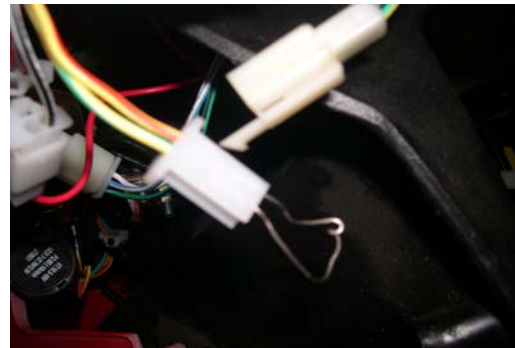
- c) If the voltage is more than 15V, it means the DC/DC transform switch is broken, change the transform switch.
- d) If both sides have no voltage, that means the switch is broken, change the switch assembly.
- e) Wrongly connect: Follow the circuit diagram check and reconnect.

11. The light doesn't work.

- 1) The light switch is defective.
Replace the light switch
- 2) The bulb is defective.
Replace the bulb.
- 3) The transform switch is defective.
Replace it.
- 4) The cable connection is broken or the connector is loose.
Check the cable and connectors.

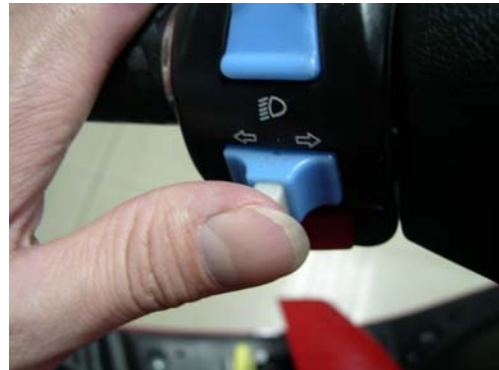


a) The headlight: Disassemble the front top cover, use the multimeter to test the bulb (Turn on the switch in advance) If there is voltage output and no more than 15V, but the headlight is not on, that is to say the bulb is not connect well or the filament is burnt, please change the bulb. If there is no voltage output, use the multimeter to test the wires, the red pen to the yellow/red line, the black pen to the green line. If the voltage is at 12V-15V, the headlight switch is broken, please change it. If no voltage or the voltage is higher than 15V, that is means the DC/DC transform switch is broken, change the transform switch and check the right connection of the circuit.



b. The brake light: If the filament is burnt, change the bulb. Disassemble the front top cover and find the plug of the brake switch, turn on the main switch, connect the lines, if the light is on, the brake switch is broken, please change the brake switch. If the light is not on, the bulb is broken or the connection is not well, change the bulb, check and reconnect.

c. The winker: Dial the turning switch, then press the return button, if you can't feel or hear the return voice, that is to say the turning switch is broken, change the turning switch. If the winker was not connected well, please check and reconnect. If there is no voltage between the winker lines, this is the way to test: Use the multimeter to measure the voltage between the yellow/red line and the green line, turn on the main switch, if there is a 12V voltage, the circuit is ok, if no voltage or the voltage is higher than 15V, that means there is something wrong with the transform switch. Please check the circuit or change to a new transform switch. If the flasher is broken, please examine as follows: Measure the voltage between the yellow/red



and the green line which connect to the flasher, if there is a 12V voltage, and the circuit and the winker are alright, turn on the main switch and the turning switch, if the winker doesn't work, that means the flasher is broken, please change the flasher.

12. The motor makes a loud noise.

- 1) The ball bearings in the motor are defective.
Replace the motor.
- 2) The rotor of the motor grinds on the cover.
Replace the motor.
- 3) The alnico is loose.
Replace the motor.
- 4) The motor cover is misaligned.
Adjust it, or replace the motor if need be.
- 5) The Hall Effect in the motor is defective.
Replace the motor.

13. The power supply to the motor is greater than normal

- 1) The alignment of the alnico is defective.
Replace the motor.
- 2) There is a short circuit between the "+" and "-" electrodes.
Check for the short circuit and fix it.
- 3) There is a short circuit inside the copper coil.
Replace the motor.
- 4) The ball bearings grind against the axle.
Polish the axle, or replace the motor if needed.
- 5) The payload is too high.
Reduce the payload.

14. The scooter doesn't run because the control unit is defective.

- 1) The "+" and "-" electrodes are reversed.
See Checking the Electronics and Electric Components.
- 2) There is a short circuit in the control unit.
See Checking the Electronics and Electric Components.
- 3) The components in the control unit appear to be defective.
See Checking the Electronics and Electric Components.
- 4) A soldered joint in the control unit is defective.
See Checking the Electronics and Electric Components.




15. The drive mileage is only half of the normal





- 1) The battery is overtime
Change the battery
- 2) Only one set of the batteries work
Change the relay
- 3) The battery wires not connect or not connect well
Change the wires and connect again
- 4) One set of the batteries can not charge
See the reference of the battery can not charge


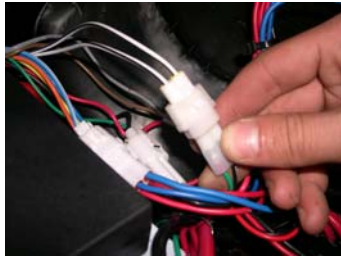

16. The speedometer doesn't work



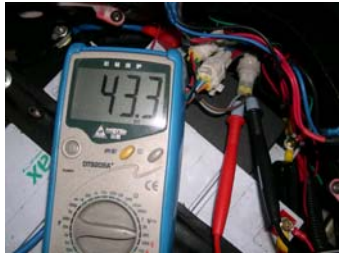
- 1).The line is broken
Change the line
- 2) The counter is broken
Change the counter
- 3) The speedometer is broken
Change the speedometer


Checking the Electronics and Electric Components:

Item	Number and color of the cable	Picture	Explanation
1.1 Checking the phase cable	1x red 1x black 1x yellow 1x green 1x blue		Set the multimeter to "through current". The control unit must be disconnected. Black pin to black pole, red pin to red pole. The display must be approx. "1.2". Connecting the red and black poles will cause energy to discharge again. Now - black pin to black pole and red pin to green pole. The display must be approx. "1.5". Discharge the energy again and do the same with the blue and yellow poles.
1.2 Checking Power IC diodes	1x red 1x black 1x yellow 1x green 1x blue		Multimeter setting same as 1.1. The control unit must be disconnected. Black pin to red pole, red pin to black pole. The display must show approx. 835 (+/- 3%) Then, red pin to black pole, black pin in succession to the yellow, green, and blue poles. The display must be approx. .450 (+/- 3%)
1.3 Checking the signal	1x black 1x red 1x yellow 1x green 1x blue		Set multimeter to 20 VDC. The control unit must be connected. The scooter must be switched on. Red pin to red pole, black pin to black pole. The display must show 6 V. Then, connect red pin in succession to yellow, green, and blue poles. At the same time, turn the

			motor by hand very lightly. The display must alternate from 0.04 VDC to approx. 5.37 VDC and then back to 0.04VDC.
2. Checking the brake contact	1x brown		Set multimeter to 20 VDC. The control unit must be connected and the scooter switched on. Black pin to any black pole; red pin to brown pole. Now, squeeze both brake levers in succession. The display must show approx. 12 V (+/- 1VDC)
3. Checking the power button	1x orange		Set multimeter to 20 VDC. The control unit must be connected and the scooter switched on. Black pin to any black pole; red pin to orange pole. Now, press the power button. The display must show approx 12 v (+/- 1VDC)
4. Checking the battery level display	1x yellow/green		Set multimeter to 200 VDC. The control unit must not be connected. Red pin to thin red cable (pole) which come out of the control unit individually; black pin to yellow/green pole. The display must be approx 50 VDC
5. Ignition switch cable	1x red		Set multimeter to 200 VDC. The control unit must be connected and the scooter switched on. Black pin to the thick black pole and the red pin to the red pole. The display must be approx. 48VDC

<p>6. Throttle handle</p>	<p>1x black 1x red 1x white</p>		<p>Set multimeter to 20 VDC. The control unit must be connected and the scooter switched on. Black pin to black pole and red pin to red pole. The display must show 6 VDC. Then, black pin to black pole; red pin to white pole. Turn the throttle handle slowly and watch the display. The motor should start between 1.5 VDC and 1.7 VDC. At full throttle, 5.2 VDC should have been reached. By the way, top speed will have already been reached at 4.5 VDC</p>
<p>7. Side stand</p>	<p>1x white/black 1x white/black</p>		<p>Set the multimeter to through current. Switch off the scooter. Red pin to white/black pole and black pin to white/black black pole. When the stands are folded in, a continuous signal must sound; when it is folded out, there is no sound.</p>
<p>8. Relays placed in parallel</p>	<p>1x grey 1x brown</p>		<p>Set multimeter to 2 k. The scooter must be switched off. Red pin to grey pole and black pin to brown. You can also measure directly on the relays. The display must show between .160 and .230. If this isn't the case, then one of the two main relays is defective.</p>

<p>9. Single relays</p>	<p>See illustration</p>		<p>If you have established that a relay is defective, please detach one of the two parallel connections (thin red cable connection between the two relays). Set red and black pins respectively to one of the two small poles on the respective relay. Do this in succession for both relays. The display must show between .40 and .60 in each case.</p>
<p>10. Control Box</p>	<p>See illustration</p>		<p>The control box regulates the charging process and recognizes if one or two chargers are connected. Connection for side stands. Fuse of the ignition switch in case the main relays fail and the scooter can't be run without a key.</p>
<p>11. Measuring voltage</p>	<p>1x grey 1x brown</p>		<p>The multimeter must be set to 200 VDC. The scooter must be switched on. The batteries must be fully charged. Red pin to grey pole and black pin to brown pole. The display must show no less than 43 VDC. When the side stand is folded out, the circuit must be broken and the display should go to 0 VDC.</p>

<p>12. Relays in control box</p>	<p>1x yellow 1x orange 1x red</p>		<p>Set the multimeter to through current. The scooter must be switched off. For this, the control box doesn't necessarily have to be connected. Red pin to yellow pole and black pin to orange pole; a signal must sound. Red pin in succession to yellow and orange and black pin to red pole of the 3P plug; The display should be approx .468</p>
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