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PRC4014b

BREEZE-C

The Senior Class Lifestyler Maintenance Manual



**A F I K I M
E L E C T R I C
V E H I C L E S™**

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1. Safety instructions

1.1 General:

- 1.1.1 Technicians who are servicing the scooter should be authorized to service the scooter.
- 1.1.2 Technicians who are servicing the scooter should be aware and follow all safety instructions within the User Manual.
- 1.1.3 Technician should follow general safety instruction like using gloves, safety glasses when needed.
- 1.1.4 The scooter weight with batteries is about 100 kg even lifting 1 wheel is about 30 kg. Always use other people help or an appropriate lifting device.
- 1.1.5 When lifting always use your legs and not your back.
- 1.1.6 The battery weight is about 14 kg. The power unit weight is about 15 kg. The seat weight is about 20kg.
- 1.1.7 Never do any change in the product before consulting the manufacturer engineering. Remember the products are approve as they are, any change remove the manufacturer responsibility for the safety of the product.

1.2 Drive :

- 1.2.1 Technicians who are driving the scooter should be aware and follow all safety instructions within the User Manual.

1.3 Mechanic :

- 1.3.1 It is possible that a technician will need to operate the scooter when he is standing on the side, working on different assemblies.
- 1.3.2 When no electric power and operation needed, always Stop the power by Switch OFF and disconnecting the battery terminals.
- 1.3.3 Never put any part of your body under the scooter parts.
- 1.3.4 If necessary, first place a wood block under, to make sure no injure will happen.
- 1.3.5 Use standard tools. Use them according to their safety instructions .

1.4 Electric :

- 1.4.1 If necessary to operate the scooter when you are not seating on it. In such cases you should be aware to the parts that can move by power – Power unit shafts and wheels.
- 1.4.2 Never put your hands close to a part that is moving or turning. Be aware that your cloth will not be trapped into one of the moving parts.
- 1.4.3 Batteries contain a large electric energy inside. This energy can cause sparks and heat metals when short circuiting.
- 1.4.4 When working on the battery terminals, make sure no to short circuit between any 2 terminals. This can cause strong spars and make the tools very hot.
- 1.4.5 When working on the batteries, use protecting gloves and safety glasses.
- 1.4.6 Battery contains acid. Never open any of the battery case. If you see any liquid or Gel aside, beware of it. It might be Acid.

2. **Specific Tools for technicians**

- Standard tool box (wrenches, socket-head cap screw, hexagon keys, Phillips (crosshead) tip and/or screwdrivers, etc.)
- Voltmeter (To measure 24VDC)
- Air pressure gauge (To measure 35 psi)
- Batteries tester (under load)
- Density meter
- Valve Wrench
- Wooden blocks to elevate the Breeze during checks, maintenance and repairs:
 - ✓ 2 blocks 20-22 centimeters height to place beneath the batteries box.
 - ✓ 2 blocks 14-16 centimeters height to place beneath the foot rest area.
 - ✓ **Remark** : Always before operating a lifted Breeze make sure that the 2 rear wheels are free to turn , so that the scooters will not move.

3. **Specific Parts:**

We recommend the availability of the following set of test and repair assemblies:

1. Front Board
2. Main Harnesses Cable.
3. Main Lights Harness Cable.
4. Main Supply Harnesses.
5. Controller S-Drive 120A - P&G
6. Motor/Power Unit
7. Also it is very much recommended hold and use P&G SP1 Programmer (for S-Drive, possible to upgrade old model of SP1 programmer to fit the S-Drive free of charge.

4. Options / Accessories assembling :

Most accessories based on the rear square pipe :



The accessories are :

4.1 – Rear Basket



4.2 – Seat safety belt



4.3 – Walker Holder



4.4 – Cane Clip Attachment




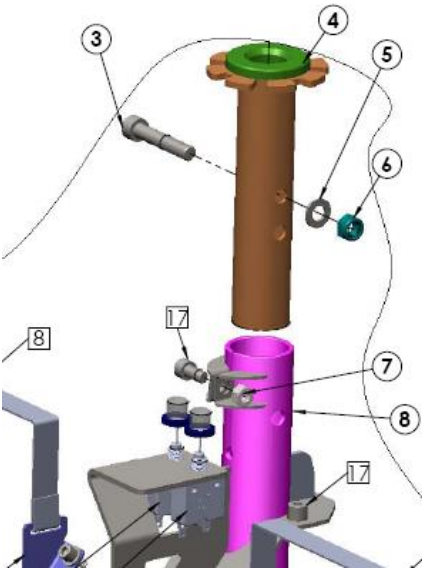
4.5 – Single Cane Holder



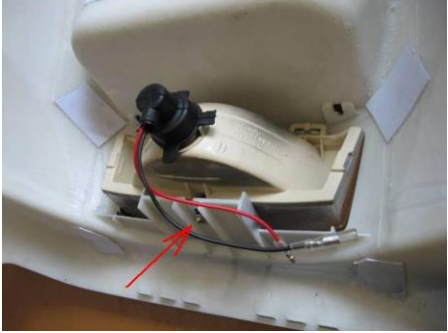


4.6 – Double Cane Holder



5. Mechanical Adjustments

#	Description	Where	How to Adjust
1	Seat Height	<p>Seat pin under the battery cover.</p>  <p>See attached assembling drawing:</p> 	<p>Release both secure bolt and level bolt. Change pin Level hole as required . Rescuer both level bolt and secure bolt.</p> <p>Adjustments : 3 x 20 mm.</p>

<p>Armrest</p>	 <p>Adjust the width .</p>  <p>Adjust the angle.</p>	
<p>Front lights</p>		<p>Release the screw and adjust The angle of the front lights.</p>

6. Front Electronics Board Setup

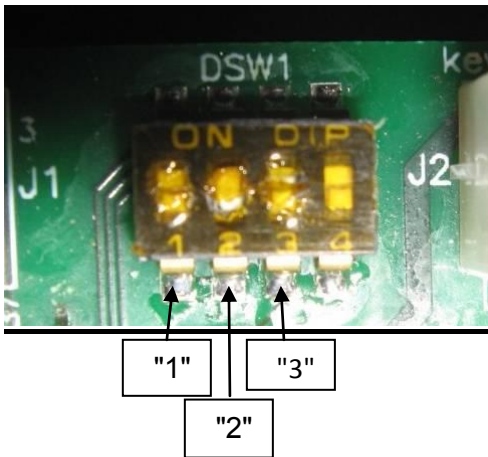
The Horns can be setup to work in one of the follows options : Controller alarms, Tiller push button , Reverse alarm , Blinkers alarms.

The front board include setup options for the Horn. This can be done with the dipswitch DSW1 that is on the front board.

Deep switch : User Modes setup with relate to user needs.

Dip Switches Setup is as follows : (Shown the Default Set Up)

State	Description
"1" = Off	Horn while blinker or hazard are on .
"2" = On	Horn while derive backward
"3" = Off	When the battery too low – the scooter stop.
"4" =	No use.



7. Controller Programming / Setup

If the user cannot find a position on the half speed limit switch control that suits him, the controller can be programmed to meet his needs. The controller can be programmed in two ways – with an SP1 Programmer or specialist PC software and interface cable.

The SP1 is a small hand-held unit which can be plugged into your controller to alter the program or into the charger socket .

The PC Programmer is a piece of PC software and an interface cable. When the software is installed onto a PC, it can then be connected to the controller by using the special interface cable. The controller can then be programmed using a windows type environment

The programming tools may be included with your scooter. If they are not, the scooter distributor or service agent or scooter manufacturer will be able to program the controller.

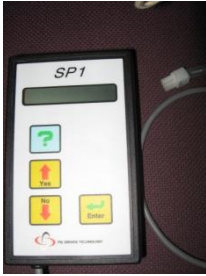
If you have a programmer, read the user guide before you use it.

If you re-program your controller, make sure that you observe any restrictions given in your scooter user manual. Note any changes you make for future reference.

Programming should only be conducted by healthcare professionals with in-depth knowledge of PGDT electronic controllers. Incorrect programming could result in an unsafe set-up of a scooter for a user. PGDT accept no liability for losses of any kind if the programming of the controller is altered from factory pre-set values.

7.1 Controller Programming with hand programmer SP1 :

The list of parameters fit to power-units 950W-12km/h,10km/h and 15km/h.
The parameters refer to "S-Drive 120" controller with hand programmer "SP1"
To program through the "Charge Socket" use the adaptor.



Programmer SP1



Adaptor to the Charger Socket

Instructions to change the parameters :

1. Connect the adaptor to the programmer and connect to the "Charge Socket" – the programmer will start working.
2. The up / down arrows let you choose the parameters.
3. In order to change a parameter – stand on the parameter press "enter" the values will then appear in the display window.
4. With the help of the arrows you can change the values.
5. After changing the value push enter the scooter will beep – turn key switch off and then on.
6. The programmer will display the next parameter. To make further changes repeat step # 5
7. Press enter again to return to the parameter menu
8. When you get to the "Engineer Menu" press enter to get to the sub-menu

How to improve and to adjust parameters to the customer :

1. Change the acceleration of the scooter, forward --- Line 1.
2. Change the deceleration of the scooter, forward --- Line 2.
3. Change the acceleration of the scooter, reverse --- Line 3.
4. Change the deceleration of the scooter, reverse --- Line 4.
5. Change the max. speed – forward --- Line 5.
6. Change the max. speed – reverse .--- Line 7.
7. Change the direction of travel of the Wig-Wag. Invert Throttle --- Line 9 .
8. The time until entering into sleep mode when the key switch is "On" .
Sleep Timer --- Line 10.
9. Reads the Code number of faults and how many times they occurred.
Read System Log. Read System Log --- Line 11 .
10. Working time of the scooter. Read timer --- Line 12.

7.2 Controller Parameters List (for manual and PC programmer)



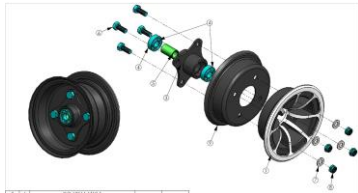
See external separated file.

8. Periodic maintenance Check

<u>No.</u>	<u>Type of Service</u>	<u>Who</u>	<u>Frequency</u>
1	Check air pressure in all tires.	User	Every week
2	Check normal drive and stop	User	Every Month
3	Check tires wear	User	Every Month
4	Check for missing parts and damaged parts .Use the figures	User	When receiving the Breeze C or after a long time not using it.
5	Check secure of all screws and parts	Technician	Once a year by technician.
6	Batteries replacing.	Technician	Every 2-3 years , after about 300-400 full cycles of charge/discharge. When short travel distance and/or technician check. Note: To Replace the batteries, the Seat and Battery Cover located under the Seat must be removed.
7	Cleaning	User Technician	External – when needed. Internal – Once a year.
8	Check power unit	Technician	Check noise , clearance , current on surface should be 12 to 14 Amp.
Removing the Seat and the Batteries Cover(2)	<p>Turn the Seat by using the lifting Lever so that the Lever will point 45° Right or Left. The Seat can be removed only at this position.</p> <p>Remove the Seat (7): Hold the Seat in your two hands – one hand on the backrest and a second hand at the front lower part of the seat and lift the seat up from its pivot.</p> <p>Warning! The seat weight is 20 Kg (44lbs).</p> <p>Keep lifting with your Knees/legs and not loading your Back. Release Battery Cover (2) securing screws (2.6).</p> <p>Lift the Battery Cover (2) until it is released from the Seat Pivot .</p>		
Replacing the Batteries Cover(2)	<p>The replacement of the Cover is done in reverse order; MAKE SURE that the Cover (2) fits onto it's place. Secure with the 4 screws (2.6).</p>		
Batteries	<p>Batteries weight each is ~14 Kg (~30 lbs) and over.</p> <p>Lift each battery only with the appropriate handle. Keep lifting with your Knees/legs and not loading your Back.</p>		
Tires	<p>Correct air pressure in the tires is essential for optimal steering and stability of the Breeze C. Check air pressure every two weeks.</p> <p>Inflate to the proper air pressure: 25 ±2 psi. Breeze 4W front tires: 25±2 psi. Golf wheels tires: 25±2 psi.</p>		
Cleaning	<p>Use only a damp cloth and mild detergent. Never use a hose for cleaning. This may severely damage the power and electronic components.</p>		

9. Mechanical Fault troubleshooting

#	Description	Probable cause	Repair action
1	Noises from front steering and suspension system	Check front suspension for clearances and secure of bolts. Check front shock absorbers. Check the rod end for clearance.	Replace wear parts, secure bolts. Replace if needed.
2	Front suspension not functioning properly.	Check front shock absorbers.	Replace if needed.
3	Excessive wear of front tires after short period.	Wear of bushings that cause clearances in the system. Un adjusted steering system.	Replace wear parts , Adjust the steering and secure.
4	Rear suspension Noisy.	Wear in power unit absorbing Rubbers. Check for clearances and unsecured parts. Check the shock absorbers.	Replace the absorbing rubbers if needed. Secure parts. Replace shock absorbers if needed.
5	Rear suspension not functioning	Check user weight and the fit of the absorbers. Faulty shock absorbers	Replace if needed Replace if needed
6	Noise from power unit.	Wear in power unit	Check and replace power unit if needed
7	Too short distance travel between charging	Power unit wear, consume high current. Also might be noisy. Battery – low voltage -	Check noise and current and replace if needed. Replace the battery. Check the charger.
8	Clearances in tiller	Unsecured screws and gas piston faulty	Check secure of screws. Replace gas piston if needed.
9	Scooter does not have power or does not brake well or go to high	Wear in motor brushes.	Replace motor brushes.

	speed downhill.		 
10	Noises from motor	Wear of brushes. Faulty motor.	<p>Check brushes and replace if needed.</p> <p>Replace motor.</p>
11	Flat tire and uneven and not smooth drive	Flat tire	<p>Repair / replace tire's tube.</p> <p>Take out the cover</p> <p>Open the central nut.</p> <p>Take out the air.</p> <p>Open the 4 screws.</p>  <p>Replace the tube.</p> <p>Inflate the tub a little bit before assemble .</p> <p>After assemble inflate to 25 +/- 2 psi.</p>

10. Control and Electronics system fault troubleshooting

10.1 General control system and Front Board Troubleshoots

The front board is the center of all peripheral functions of the scooter: Lights , Horn , Information goes to the LEDS on the display .

Elimination troubleshoots:

The Front Board wiring connections are all quick connectors.

If you suspect the Front Board to be faulted we recommend as a quickest way to find if the Front Board is faulty, Doing by elimination – Just replace temporarily the Front Board with another working one and thus make sure if the problem is within the Front Board or somewhere else.

Check all connection of the Front Board, following the wiring diagram that can be found at the end chapter of this maintenance manual.

Check main and Charge fuse, located under the seat.

Also always check related function switch , as an example Light does not work , first check the light switch for continuity ,when it is in ON position. Use the wiring diagram to figure the proper terminals to check each function switch terminals.

Trouble Shoot Table:

#	Description	Probable cause	Repair action
1	Front light doesn't work	Front LED board faulty	Replace front LED board
		Front Board faulty	Replace Frond Board
2	Front Blinker/s doesn't work	Front Blinker board faulty	Replace front Blinker board
		Front Board faulty	Replace Frond Board
3	Rear pilot/s light does work	Rear Blinker board faulty	Replace Rear Blinker board
		Front Board faulty	Replace Frond Board
4	Rear Blinker/s doesn't work	Rear Blinker board faulty	Replace Rear Blinker board
		Front Board faulty	Replace Frond Board
5	Horn does not work properly	Horn is faulty	Replace Horn
		Horn is faulty	Replace Frond Board
		Front Board faulty	Replace Frond Board
6	Hazard doesn't work	Hazard switch fault	Check switch and repair
		Front Board faulty	Replace Frond Board
7	Reverse function doesn't work	Reverse switch fault	Check switch and repair
		Front Board faulty	Replace Frond Board
8	Electric EMB release function does not work	EMB release Switch faulty	Check switch and repair
10	No Charge start	Charger fault	Replace charger
		Charge fuse popup or faulty	Reset /Replace charge fuse
11	Travel distance very low	Charger fault	Replace charger
		Old / Weak batteries	Check Batteries / charge batteries, Replace if needed.
13	No ON / Supply power to the control system	Over load Mechanical fault Faulted controller Faulty power unit Short circuit occur	Try to reset 2 times. Troubleshoot the fault. Replace the controller. Replace the power unit. Find and repair short circuit. Note: Main Fuse is located under the seat.

10.2 Controller Troubleshoots

The controller is the center of all driving functions of the Breeze S: Speed control , acceleration , deceleration , EMB (Electro Magnetic Brake used as parking brake) , Reverse drive , Speed limiting etc. . But still the functions of the controller are all connected to all the wiring, connectors and as well the Front board, power units and batteries.

If any driving misbehave occur

Elimination troubleshoots:

The controller wiring connections are all quick connectors.

If you suspect the controller to be faulted we recommend as a quickest and way to find if the controller is faulty, Doing it by elimination – Just replace temporarily the controller with another working one and thus make sure if the problem is within the controller or somewhere else.

Note: Make sure the controller have the rights parameters setup.

Check all connection of the controller, following the wiring diagram that can be found within this maintenance manual.

Controller inform faults Codes in 2 ways:

(1) The main LED ON/Fault indication. (2) SP1 programmer.

Trouble Shoot Table for the ON/Fault LED:

#	Description	Probable cause	Repair action
1	Power is On in the LED display but Scooter does not drive. No code shown.	Controller fault Wiring connectors fault. Front board fault	Replace controller Check repair wiring /connector. Replace front board.
2	The "LED" On/Off Indicate the problem By flash code sequence		
2.2	* *	Low battery .	Battery empty .need to recharge Change the charger. Replace the battery.
2.3	* * *	High Battery voltage	Check the charger.
2.5	* * * * *	E.M.B problem.	Check the wire from E.M.B, Change the E.M.B.
2.6	* * * * * *	Throttle trip	The accelerate lever pressed while turn the key switch to On. Check the wires to the controller
2.7	* * * * * *	Throttle trip	The accelerate lever pressed while turn the key switch to On. Check the wires to the controller
2.8	* * * * * *	Motor disconnect	Check the wires to the Motor.
2.9	* * * * * *	Controller fault	Replace the Controller.
3	Power is On display and a code is shown. Scooter does not drive.	A known fault of the controller has been found	See follows Fault Bars table and repair the according.
4	No power is On panel display.	Power supply or another control system	Follows (10.1)- General Control system trouble shoot.
5	Jerky movement	Uncharged batteries. Weak /Old batteries.	Charge / Check batteries and replace if needed.

10.3 The fault code from the SP1 Programmer :

(More codes you can see on the hand programming SP1).

When the fault exists, connect the SP1 programmer's connector directly to the controller SDRIVE or to the charging socket, using a special wiring adaptor.

The fault will be displayed on the SP1 programmer display.

Table 1:

Fault Code	Action to troubleshoot
0300	Check the tiller & throttle wiring to the controller, then retest
0815	Check the tiller & throttle wiring to the controller, then retest
0A00	Check the sleep mode parameter is set correctly, then retest
0E08	Check the tiller & throttle wiring to the controller, then retest
0E07	Check the tiller & throttle wiring to the controller, then retest
1501	Check the solenoid brake's wiring & connections to the controller, then retest
1502	Check the solenoid brake's wiring & connections to the controller, then retest
1600	Check the batteries' wiring & connections to the controller, then retest Also possible a condition of high load driving downhill.
1601	Check the batteries' wiring & connections to the controller, then retest
1E08	Check the wiring & connections to pin 4 of the programming socket, then retest
1E09	Check the wiring & connections to pin 6 of the 14 way tiller connector, then retest Inhibit 2 - check EMB manual brake micro switch.
1E0A	N/A for Breeze C.
2C00	Check the batteries' wiring & connections to the controller, then retest
2F01	Check the throttle is not displaced on start-up, or does not return to natural condition , then retest
2F01	Check the tiller & throttle wiring to the controller, then retest
3100	Battery connected whilst scooter is switched on. Turn off, wait 10 seconds, then retest
3B01	Check the motor wiring & the connections to the controller, then retest
3D02	Check the motor wiring & the connections to the controller, then retest
3D03	Check the motor wiring & the connections to the controller, then retest
4401	Internal controller fault. Replace the controller (Make sure for the parameters setup).
5300	Programmable parameter changed. Turn the scooter off, then ON again, then retest
All the others	Check all wiring & connections to the controller, then retest

Table 2:

No power to programmer	Check the wiring & connections to the batteries, then retest
No power to programmer	Check the wiring & connections to the programmer, then retest
Scooter drives slowly	Check the controller is programmed correctly, then retest
Scooter drives slowly	Check the speed limiting function is not active e.g. seat raised, then retest
Scooter drives slowly	Check the solenoid brakes are not jammed, then retest
Status indicator does not light	Check the wiring & connections to the status indicator, then retest
Reverse alarm does not sound	Check the wiring & connections to the buzzer then retest
Reverse alarm does not sound	Check the buzzer is working correctly, then retest
Reverse alarm does not sound	Check the scooter is programmed correctly then retest
Scooter will not drive in reverse	Check the tiller wiring & connections, then retest
Scooter will not drive in reverse	Check the reverse switch is working correctly, then retest

11. Mechanical assembly drawings

See attached assembling drawings: "Breeze C (3, 4W) assembling.pdf".

12. Spare parts list :

Can be found, using the assembling drawings.

13. General Wiring diagram:

