

TECHNICAL SERVICE BULLETIN

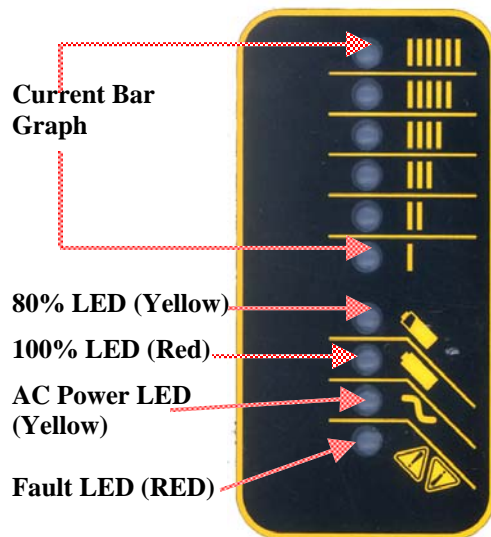
NSS Enterprises, Inc.



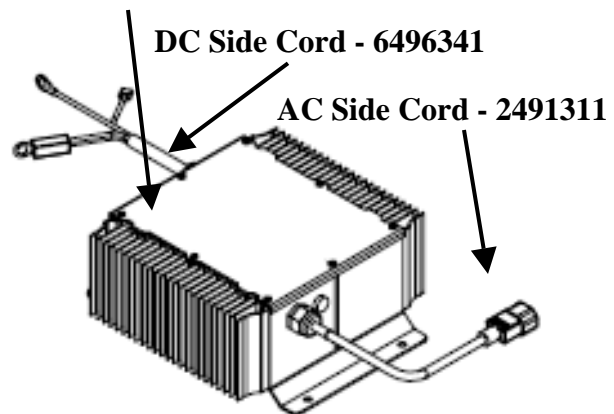
Please post for your Service Department to see

To: NSS Distributors & Service Centers
Date: March 13, 2006
Product: All Battery Powered Machines
Subject: Onboard Battery Chargers

PRODUCT OVERVIEW



24v Charger Complete - 2491271
 36v Charger Complete - 6495691



AC Power Cord (120 Volt) - 6495701
 AC Power Cord (240 Volt) - 6495711

1. Connect charger power cord to a properly grounded outlet. When using an extension cord, avoid excessive voltage drop and extended charge times by using a grounded 3-wire 12 AWG cord for 50' lengths or shorter and 10AWG for greater than 50' lengths.
2. The charger will automatically turn on and undergo a short LED indicator self test. A trickle current will then be applied until a minimum voltage is reached. The charger will then enter the bulk charging stage.
3. The **current output bar graph** will indicate the current to the battery as the charger moves through its charge profile. The length of charge time will vary by how large and how depleted the battery pack is, voltage, and external temperature. If the AC voltage is low (below 108V) the charging power will be reduced, and the **AC Power LED** will flash yellow. If the outside temperature is too high, the charging power will also be reduced and the **bar graph** will flash yellow.

**If you have questions please contact:
 NSS Technical Services 800-261-3499**

4. When the **yellow 80% LED** is lit, the batteries are at approximately an 80% charge. The charging could be terminated at this point if the machine requires immediate usage, however, it is recommended to wait until the charging cycle is completed. This is indicated when the **green 100% LED** stops blinking and remains on continuously. This helps maintain maximum battery capacity and battery life. The charger may now be unplugged from AC power.
5. If left plugged in, the charger will automatically restart a complete charge cycle if the battery pack voltage drops on average below 2.1 volts-per-cell or 30 days has elapsed. If an error occurs anytime during charging, the **red Fault LED** will flash (see page 3).

Checking the Charging Algorithm

The charger comes pre-loaded with nine algorithms for Lead Acid, Gel Cell, and AGM batteries as detailed in the following tables. The algorithms are numbered 1-8 and 27. Each time AC power is applied with the positive connector NOT connected to the battery pack, the charger enters an algorithm select/display mode for approximately 11 seconds. In this mode, the present algorithm is displayed on the **LED current output bar graph** or **80% LED**. If the algorithm # is from one to six, it will be displayed on the **current output bar graph** with the lowest LED indicating that Algorithm 1; the second lowest LED indicates that Algorithm 2 is selected, etc. The algorithm number is also indicated on the **80% LED** by the number of blinks separated by a pause (algorithms 7, 8, and 27 are only indicated with the **80% LED**).

Changing the Charging Algorithm

1. To change the algorithm, touch the positive battery connector* anytime during the 11-second display period to the battery pack's positive terminal for 3 seconds and then remove; the algorithm number will advance after 3 seconds. Repeat until desired algorithm number is displayed. A 30 second timeout is extended for every increment. Incrementing beyond algorithm 27 moves back to algorithm 1. After desired algorithm is displayed, touch the charger connector to the battery positive until the output relay is heard to click (~10 seconds) the algorithm is now in permanent memory.

For Champ series, this is the **small red lead attached directly to the battery pack. For all other machines, this is the **large red** lead directly attached to the battery pack.*

2. Remove AC power from the charger. Leaving the positive lead disconnected, reapply AC power to verify the newly changed algorithm (as described above). Remove AC power and reconnect the red lead to the battery pack.

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Algorithm TablesNSS Batteries

Alg #	Batt V	Sys V	Amp Hrs	NSS Part #
1	12	36	210	4491061
1	6	24/36	225	3390361
5	12	24	115	2392111
5	12	24	145	6393651
6	12	24	100	2392731**
6	6	24/36	180	6491931**
27	6	36	325	2691501
27	6	36	395	7691401

** Gel Cell Batteries

Other Common Batteries

Alg #	Battery Type
1	Trojan T105
2	Trojan T105 tapped
3	T105 DV/DT CP
4	US Battery USB2200
5	Trojan 31 XHS
6	DEKA 8G31 Gel**
7	J305 DV/DT CP
8	Concorde 10xAh AGM
27	Crown CR-325

Fault Codes

If a fault occurred anytime during charging, the **red FAULT LED** will flash. To indicate which error, the **FAULT LED** will flash a number of times, pause, and repeat.

1-FLASH - Battery Voltage High: auto-recover

2-FLASHES - Battery Voltage Low: auto-recover

3-FLASHES - Charge Timeout: the charge did not complete in the allowed time. This indicates a problem with the battery pack (voltage not attaining the required level), or that high external temperatures reduced charging.

4-FLASHES - Check Battery: the battery pack could not be trickle charged up to the minimum level required for the charge to be started. This may indicate that one or more cells in the battery pack are shorted or damaged.

5-FLASHES - Over-Temperature: auto-recover. Charger has shutdown due to high internal temperature. Charger will restart and charge to completion if temperature comes within accepted limits, but the **fault LED** indication will remain until the charger has been reset (AC removed).

6-FLASHES - QuiQ Fault: an internal fault has been detected. If Fault 6 is again displayed after interrupting AC power for at least 10 seconds, the charger must be brought to a qualified service depot.

Part Number	Part Description
6496341	DC Side Cord and Panel Assembly
2491311	AC Side Cord and Panel Assembly
6495701	AC Power Cord (120v)
6495711	AC Power Cord (240v)
2491271	24v Complete Onboard Charger
6495691	36v Complete Onboard Charger

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