


| PARTS LIST   |                  |       |             | REVISION |
|--|------------------|-------|-------------|----------|
| ITEM NO.   | MATL. MASTER NO. | REQD. | DESCRIPTION |          |
| <p><b>MANUAL INSTRUCTIONS POWER BUILDER. THIS MANUAL IS MADE FROM 70# WHITE OFFSET PAPER, CONSISTING OF 4 PAGES PRINTED BOTH SIDES WITH A SELF COVER PRINTING A 20% COLOR-BAND ALL COPY PRINTS BLACK. OVERALL SIZE IS 17 X 11 INCHES FOLDED TO A FINAL SIZE OF 8-1/2 X 11, DRILLED FOR A STANDARD 3 HOLE (5/16 DIA. ) RING BINDER.</b></p> <p><b>MANUAL REVISION IS 0 DATE CODE *899</b></p> <p><b>NOTES:</b></p> <p><b>1. ORIGINAL COMPOSITION AND ARTWORK RETAINED BY TRI-AD LITHO, INC.</b></p> <p><b>*2. VENDOR'S AUTHORIZED IDENTIFICATION, TO PRECEDE DATE CODE.</b></p> |                  |       |             |          |

|  |  |                                   |   |                           |   |                                     |                                   |                                    |                                   |                       |  |   |   |  |                                |
|--|--|-----------------------------------|---|---------------------------|---|-------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|-----------------------|--|---|---|--|--------------------------------|
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|  | <b>CODE SYMBOLS</b><br>CRITICAL $\triangle$<br>MAJOR A $\triangle$<br>MAJOR B $\triangle$<br>100% INSPECTION $\triangle$ |                                   | DOCUMENT CONTROLLED BY<br>INTERCHANGEABLE PART  |                           | AUTHORIZED COUNTRY<br>AUER<br>AUSTRALIA<br>BRAZIL<br>CANADA |                                     | CHILE<br>CHINA<br>FRANCE<br>INDIA |                                    | ISRAEL<br>ITALY<br>JAPAN<br>KOREA |                       | M. EAST<br>MEXICO<br>MSA BRITAIN<br>MSA EUROPE |   | NETHERLANDS<br>PERU<br>S. AFRICA<br>S.E. ASIA |  | SPAIN<br>SWEDEN<br>SWITZERLAND |
| TOLERANCES UNLESS OTHERWISE SPECIFIED<br>FRACTIONAL $\pm 1/16$<br>2 PL. DEC. $\pm$<br>3 PL. DEC. $\pm$<br>ANGULAR $\pm$<br>SEE MSA STANDARD SHOP PRACTICES FOR DRILLED HOLE TOLERANCES |  | JOB NO. E 30000327                |   | NIOSH                     |   | MSHA                                |                                   | UL                                 |                                   | CE                    |  | CSA   |   |  |                                |
|  |  | DRAWN BY / DATE<br>TAL-GH 9/16/98 |   | CHECKED BY<br>DCN 11-6-98 |   | PROJ. ENGR.<br>D. NARDOZZI 11-6--98 |                                   | MGR. QUAL. ASSUR.                  |                                   | MGR. NEW PROD. INTRO. |  | <h1>MANUAL INSTRUCTION<br/>POWER BUILDER SINGLE UNIT</h1> |   |  |                                |
|  |  | MSA STANDARD SHOP PRACTICES APPLY |   | A                         |   | MATL. MASTER NO.<br><b>10002438</b> |                                   | DOCUMENT NO.<br><b>10000000238</b> |                                   | SCALE: FULL           |  |   |   |  |                                |

# Power Builder™ Battery Charger

part no.  
10002436 - 115/230 VAC  
50/60 Hz  
10002437 - 12 VDC

## instructions, single unit

### **WARNING**

This manual, including Warnings and Cautions inside, must be read and followed carefully by all persons who will use or maintain the product, including those who have any responsibility involving its selection, application, service, or repair. This product will perform as designed only if used and maintained according to the instructions. Otherwise, it could fail to perform as designed, and persons who rely on this product could sustain serious personal injury or death.

The warranties made by MSA with respect to the product are voided if the product is not assembled, used, and serviced according to the instructions in this manual. Please protect yourself and your employees by following the instructions. Please read and observe the **WARNINGS** and **CAUTIONS** inside. We encourage our customers to write or call for a demonstration of this equipment prior to use, or for any additional information relative to use or repairs.

Call 1-800-MSA-2222 during regular working hours, or 1-800-MSA-5555 after working hours or during emergencies.

Manufactured for

**MSA**

**MINE SAFETY APPLIANCES COMPANY**  
PITTSBURGH, PENNSYLVANIA, U.S.A. 15230

TAL 899 (L) Rev. 0

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10002438

# Description/Installation

## CAUTIONS AND WARNINGS

### IMPORTANT

Pay close attention to Warnings and Cautions in this manual. A **WARNING** describes a condition that may cause serious personal injury or death if allowed to happen. A **CAUTION** describes a condition that may cause the cap lamp or other property to be damaged if allowed to happen.

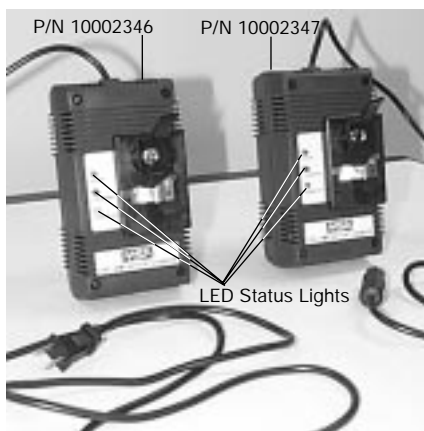
1. The cap lamp and charging systems will perform as designed only if used and maintained according to the manufacturer's instructions. Supervisors and users must read and understand these instructions before trying to use or service this product. We encourage our customers to write or call their MSA distributor or call MSA Customer Service for information on this product before using it. To reach the nearest MSA office, call 1-800-MSA-2222 during normal business hours, or 1-800-MSA-5555 after hours or in emergencies.
2. Do not alter, modify, or substitute any components without the approval of MSA.
3. Inspect and maintain the charger according to MSA's instructions. There are no user replaceable parts other than the fuses, therefore the charger should not be dismantled for any attempt to repair.

## DESCRIPTION

MSA's single-unit Power Builder charger is designed to recharge MSA's Luminator and Luminator Plus batteries. The charger is equipped with a variable rate, factory-set program controlled by a microprocessor that maximizes recharge capacity in the shortest amount of time. The charge indicator is an easy-to-read LED display; Red and Green lights show charge status.

The MSA Power Builder Battery Charger is also a "float" charger, which means that the battery will not be overcharged if left in charge mode over long periods of time.

| Technical Data           |   |
|--------------------------|---|
| Charging Method          | Automatic constant current / constant potential                                     |
| Initial Charging Current | 2.5 A max.  |
| Charging Voltage         | 5.3VDC switching to 5.0VDC (float mode 4.6VDC)                                      |
| Charging time            | Approximately 8 hrs. (after 8 hour discharge w/Ultralight lamp)                     |
| Supply Voltage           | 115/230 VAC +/-10%, single phase, 50/60 Hz, 12VDC                                   |
| Power Consumption        | AC version - 70 WATTS, 1A fuse (500mA for 230VAC);<br>DC version - 8 WATTS, 3A fuse |
| Dimensions               |   |
| Length:                  | 190mm (7.68 in.)  |
| Width:                   | 120mm (3.94 in.)  |
| Height:                  | 100mm (2.87 in.)  |
| Weight:                  | 1.65 kg (3.6 lbs.)  |

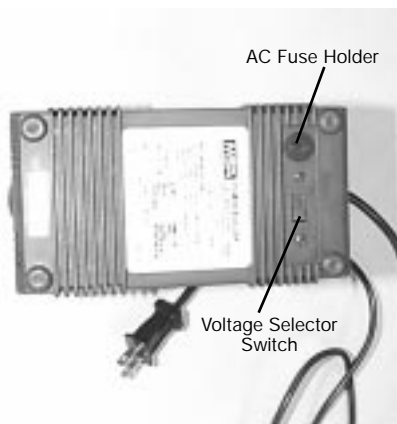


## INSTALLATION

The charger is double insulated and has a standard two conductor cable for connection to the main power supply.

The 10002346 charger is set for 115 VAC operation and supplied with a 2 prong plug and 1A fuse. For operation from 230 VAC the following steps must be taken before charging:

- the voltage selector switch underneath the charger must be set for 230 VAC.



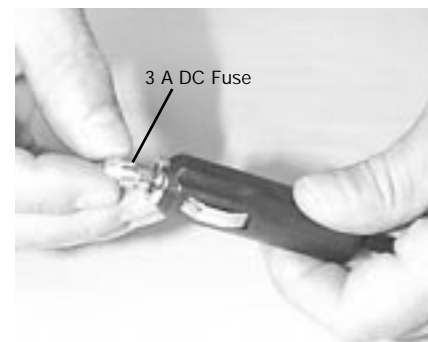
## CAUTION

**Operating the charger from 230 VAC while switched for 115 VAC will permanently damage the charger transformer and the charger will need to be replaced.**

- The 1A fuse located adjacent to the voltage selector switch must be changed to the 500 mA fuse supplied for operation at 230 VAC.
- the plug must be changed (or adapted for International usage) to match the mating outlet. For clarification of plug type and AC circuit requirements please consult with qualified electrical power personnel or standards.

The 10002437 charger is configured to operate from an automobile cigarette-style outlet and an automotive battery. The automotive battery must be capable of supplying a voltage range of 11 - 18 VDC to operate the charger properly.

A 3A DC fuse is located in the charger jack for cigarette lighter outlet charging.



## CAUTION

**It is not recommended to operate the charger with the automobile turned off for extended periods, as excessive drain on the automobile battery may result.**

# Operation/Maintenance



## OPERATION

1. Any battery must be recharged, regardless of how long it has been used, before next use in order to maintain the battery's rated capacity and cycle life. Typically, the approximate recharge time is 8 hours after a 8 hour discharge using the Ultralight lamp with either the Luminator or Luminator Plus Batteries. Longer recharge times can be expected if the ML-2 lamp, the remote power accessory, or longer discharge times are used.
2. Plug the charger into an appropriate receptacle. The yellow light located on the front panel indicates that the input power supply is "On".

3. To charge the cap lamp, the headpiece should be fitted over the projecting key on the front of the charger and rotated clockwise until it is in the full stop position. To remove the lamp from charge - reverse the procedure.

After connection of the cap lamp, the red LED will illuminate after a short time, the circuitry will wait 5 seconds then start the constant current charge (stage 1) while monitoring the charger voltage. When the charging voltage reaches 5.3 VDC the charger switches to a constant potential of 5.0 volts (stages 2 &3) for a set period of time (full charge is reached when the green LED is on only), the charger then

switches to a "float" mode voltage of 4.6 volts (stage 4) until the battery is removed. The battery state of charge is indicated by the Charge Indicator Guide

### Note

If the battery is removed or input power is interrupted, the charger will reset to stage 1 when reconnected. The charger will quickly read the level of charge in the battery then go on to the appropriate stage where it left off before the interruption. It is not advisable to leave battery partially charged for any extended length of time. Doing so will reduce the cycle life and capacity of the battery.

| Charge Indicator Guide     |                                    |                             |
|----------------------------|------------------------------------|-----------------------------|
| Stage                      | LED Display                        | Charge Status               |
| 1. Constant Current Mode   | RED light on only                  | charging                    |
| 2. Constant Potential Mode | RED and GREEN lights on            | 75% charged                 |
| 3. Fully Charged           | GREEN light on only                | charged, ready for use      |
| 4. Float Mode              | GREEN light on, RED light flashing | float charge, ready for use |

## MAINTENANCE AND ORDERING INFORMATION

THERE ARE NO USER REPLACEABLE PARTS OTHER THAN THE FUSE. THEREFORE THE CHARGER SHOULD NOT BE DISMANTLED.

1. Each AC style charger is supplied with an extra fuse for 230 VAC operation. Replace any blown fuses with the following types which are readily available through most electrical supply sources:

- 115 VAC - Fuse type - 1 A, T1AL
- 230 VAC - fuse type -500mA, T500mAL
- 12 VDC - 3AG, fast acting

The fuse holder for AC charging is located on the back side of the charger. Adjacent to the voltage selector switch. For DC charging the fuse is located in the DC charger jack. To replace a blown fuse, unscrew the fuse holder cover counterclockwise. Remove

the blown fuse, place the new fuse in the end of the cover and screw back into the holder.

2. Refer to troubleshooting guide if the charger is not working properly, or to the cap lamp user instructions for battery operation.

# Troubleshooting Guide

## FAULT FINDING

