011-1525-0

MOTOMASTER

NAUTILUS™

INTELLIGENT BATTERY CHARGER

with Optimal Charge Logic

OWNER'S MANUAL

TABLE OF CONTENTS

SAVE THESE INSTRUCTIONS.

This manual contains important safety and operating instructions. Read all instructions and follow them with use of this product.

Questions? Call Customer Service: 1-877-619-6321

INTRODUCTION

The MotoMaster Nautilus Intelligent Battery Chargers feature advanced microprocessor technology making battery charging faster, easier, and safer than ever before. This manual will explain how to use the chargers safely and effectively.

Please read and follow these instructions and precautions carefully.

SAFETY INFORMATION

Important Safety Instructions

⚠ WARNING

RISK OF EXPLOSIVE GASES

WORKING IN THE VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. FOR THIS REASON IT IS OF THE UTMOST IMPORTANCE THAT EACH TIME BEFORE USING YOUR CHARGER, YOU READ AND FOLLOW THE INSTRUCTIONS PROVIDED EXACTLY. TO REDUCE RISK OF BATTERY EXPLOSION, FOLLOW THESE INSTRUCTIONS AND THOSE PUBLISHED BY THE BATTERY MANUFACTURER.

⚠ WARNING

Handling the cord on this product or objects associated with the use of this product may expose you to lead. Wash hands after handling.

- Read all instructions, warnings, and cautions printed on the battery charger, battery and vehicle or equipment using battery.
- Use the charger for charging lead-acid batteries only (such as those used in cars, trucks, motorcycles, boats, etc.).
- Battery chargers are not intended to supply power to a low-voltage electrical system or to charge dry-cell batteries commonly used in house hold appliances such as radios, toys, camera, etc. Charging dry-cell batteries may cause them to burst and cause injury to persons and damage to property.
- Use of an attachment not recommended by the battery charger manufacturer may result in the risk of fire or electrical shock.

SAFETY INFORMATION (cont'd)

- **DO NOT** disassemble charger. Take it to a qualified service professional if service or repair is required. Incorrect assembly may result in fire or electrical shock.
- To reduce risk of electrical shock, unplug the charger from the outlet before attempting any maintenance or cleaning.
- **DO NOT** expose charger to rain or snow.
- **NEVER** charge a frozen battery. If battery acid becomes frozen, bring battery to a warm area and allow it to thaw before you begin charging.
- **NEVER** touch the battery clamps together when the charger is on. This may cause a spark.
- **NEVER** operate a charger if it has received a hard blow, been dropped or otherwise damaged. Take it to a qualified professional for inspection.
- **NEVER** pull out the plug by the cord when unplugging the charger, as this may cause damage to the cord or plug.

Personal Safety Instructions

- Make sure that someone is within range of your voice to come to your aid if needed while you work with or are near a lead-acid battery.
- Wear complete eye and clothing protection when working with lead-acid batteries.
- Avoid touching your eyes while working with a battery. Have plenty of fresh water and soap nearby for use in case battery acid contacts your eyes, skin or clothing. If this happens, wash immediately with soap and water, then get medical attention.
- **NEVER** smoke or allow an open spark or flame in the vicinity of the battery or engine. Batteries generate explosive gases.
- Take care not to drop any metal tool or object onto the battery. This may result in a spark or short circuit across the battery or another electrical device that may cause an explosion.
- Remove all personal metal items, such as rings, bracelets, necklaces, and watches from your body while working with a lead-acid battery. A battery can produce a short circuit current high enough to weld such objects to metal, causing a severe burn.
- **NEVER** attempt to charge a frozen battery *(see bullet point under Important Safety Instructions)*.
- **NEVER** overcharge a battery.
- **ALWAYS** operate the battery charger in an open, well-ventilated area.

SAFETY INFORMATION (cont'd)

AC Electrical Connections

PLUGGING CHARGER IN

Your charger requires a 120 V AC electrical wall outlet receptacle installed according to local codes and ordinances.

⚠ WARNING

NEVER alter AC cord or plug provided. If it does not fit the outlet, have a proper outlet installed by a qualified electrician. Improper connection can result in a risk of fire or electric shock.

⚠ WARNING

DO NOT operate the charger if it has a damaged power cord or plug. Have the cord replaced.

USING AN EXTENSION CORD

The use of an extension cord is **NOT** recommended. If an extension cord must be used, follow these guidelines:

- Make sure that the pins on the charger's power cord fit firmly into the extension cord and that the extension cord fits firmly into the receptacle.
- Check that the extension cord is properly wired and in good electrical condition.
- Make sure that the wire size is large enough for its length and for the AC ampere rating of the charger, as specified in the chart below.

MINIMUM RECOMMENDED EXTENSION CORD

LENGTH OF CORD, METRES (FEET)	AWG* SIZE OF CORD
7.6 (25)	18
15.2 (50)	16
30.5 (100)	12
45.6 (150)	10

*AWG=American Wire Gauge

⚠ WARNING

Use of an improper extension cord could result in a risk of fire and electric shock.

SAFETY INFORMATION (cont'd)

Preparing to Charge

CHARGER LOCATION

- **DO NOT** expose charger to rain or snow.
- Locate the charger as far away from the battery being charged as the cables will permit.
- Be sure to position the power cord to prevent it from being stepped on, tripped over or damaged.
- **NEVER** place charger directly above battery being charged. Gases from the battery will corrode and damage the charger.
- **NEVER** set a battery on top of a charger.
- **NEVER** allow battery acid to drip on charger.
- **ALWAYS** charge a battery in a well-ventilated area.

⚠ WARNING

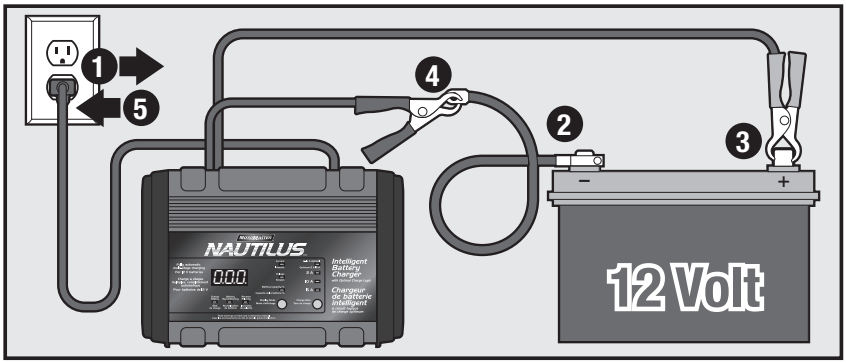
Battery chargers may get hot during operation. DO NOT set charger on flammable materials like carpeting, upholstery, paper, cardboard, etc. Charger may damage leather and plastic.

BATTERY PREPARATION

- When removing battery from vehicle to charge it, always remove grounded terminal from battery first.
- Make sure all accessories in the vehicle are **OFF** in order to prevent sparks.
- Be sure that the area around the battery is well ventilated while being charged.
- Clean the battery terminals. Be careful to keep corrosion or battery acid from getting in or around your eyes.
- For batteries with removable vent caps, if required, add distilled water to each cell until the battery fluid reaches the level specified by the battery manufacturer.
- **DO NOT** overfill.
- For batteries without removable vent caps, carefully follow the manufacturer's charging instructions.
- Study all of the battery manufacturer's specific precautions and recommendations for charging and for recommended rates of charge.
- Make sure that you have a 12 V lead-acid battery. Determine voltage of battery by referring to the vehicle owner's manual. If the charger has an adjustable charge rate, charge battery at the lowest rate first.

CONNECTING YOUR BATTERY

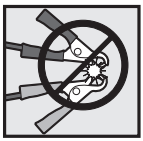
Marine Battery (**MUST** be removed and on shore for charging)



NOTE: *To charge a battery on-board requires equipment specially designed for marine use.*

1. **Before** connecting and disconnecting the DC output clamps, remove the AC plug from the electrical outlet.

NEVER allow the DC output clamps to touch each other. This may cause a spark.



- Check polarity of battery posts. A positive (POS, P, +) battery post usually has a larger diameter than a negative (NEG, N, -) battery post.

2. Attach at least a 60 cm 6-gauge (AWG) insulated battery cable to a negative (NEG, N, -) battery post.

3. Connect the positive (red) charger clip to the positive (POS, P, +) post of battery.

4. Position yourself and the free end of cable as far away from battery as possible, then connect the negative (black) charger clip to the free end of cable. **DO NOT face battery when making final connection.**

5. Connect charger AC supply cord to electric outlet. (Reverse process to remove charger.)

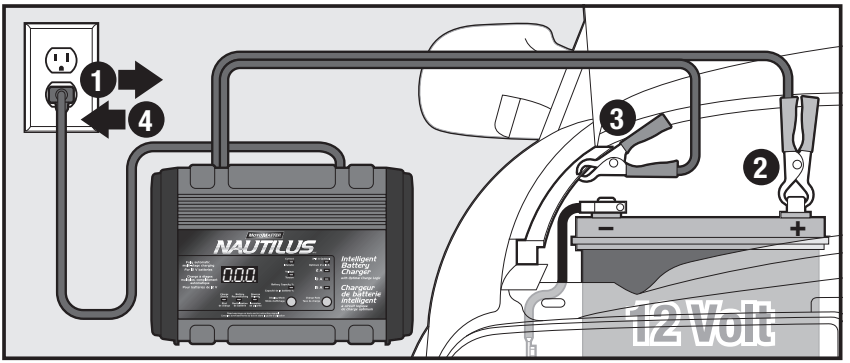
When disconnecting chargers, **ALWAYS** do so in reverse sequence of connecting procedure and break first connection while standing as far away from battery as practical.

⚠ WARNING

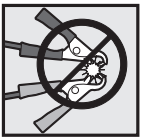
A SPARK NEAR A BATTERY MAY CAUSE A BATTERY EXPLOSION.

CONNECTING YOUR BATTERY (cont'd)

For Auto Use–Battery In Vehicle (Negative Grounded)



1 **Before** connecting and disconnecting the DC output clamps, remove the AC plug from the electrical outlet.



NEVER allow the DC output clamps to touch each other. This may cause a spark.

To reduce the risk of a spark near battery:

- Position AC and DC cords to reduce the risk of damage by hood, door, or moving engine part.
- Stay clear of fan blades, pulleys, and other parts that can cause injury.
- Check polarity of battery posts. A positive (POS, P, +) battery post usually has a larger diameter than a negative (NEG, N, -) battery post.

2 Connect the positive (red) clip from a battery charger to a positive (POS, P, +) ungrounded post of battery.

3 Connect the negative (black) clip to vehicle chassis (must be a heavy gauge metal part of the frame) or engine block away from battery. **DO NOT** connect clip to carburator, fuel lines, or sheet-metal body parts.

4 Connect charger AC supply cord to electric outlet. (Reverse process to remove charger.)

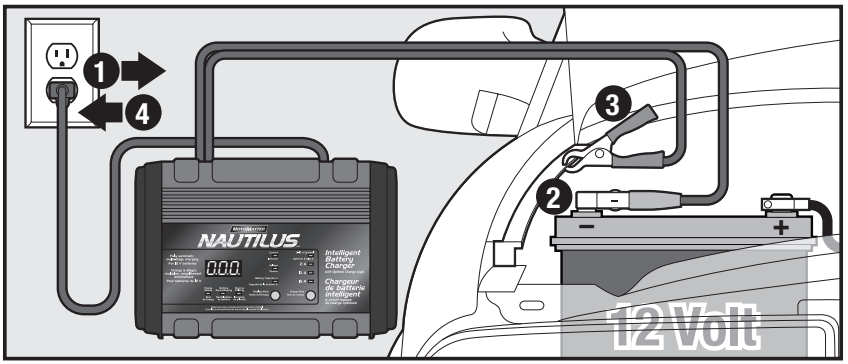
⚠ WARNING

A SPARK NEAR A BATTERY MAY CAUSE A BATTERY EXPLOSION.

NOTE: *A marine battery installed in a boat must be removed and charged on shore. To charge it on board requires equipment specially designed for marine use.*

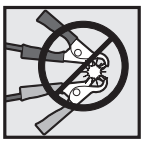
CONNECTING YOUR BATTERY (cont'd)

For Auto Use–Battery In Vehicle (Positive Grounded)



1. **Before** connecting and disconnecting the DC output clamps, remove the AC plug from the electrical outlet.

NEVER allow the DC output clamps to touch each other. This may cause a spark.



To reduce the risk of a spark near battery:

- Position AC and DC cords to reduce the risk of damage by hood, door, or moving engine part.
- Stay clear of fan blades, pulleys, and other parts that can cause injury.
- Check polarity of battery posts. A positive (POS, P, +) battery post usually has a larger diameter than a negative (NEG, N, -) battery post.

2. Connect the negative (black) clip from battery charger to negative (NEG, N, -) ungrounded post of battery.

3. Connect the positive (red) clip to vehicle chassis (must be a heavy gauge metal part of the frame) or engine block away from battery. **DO NOT** connect clip to carburator, fuel lines, or sheet-metal body parts.

4. Connect charger AC supply cord to electric outlet. (Reverse process to remove charger.)

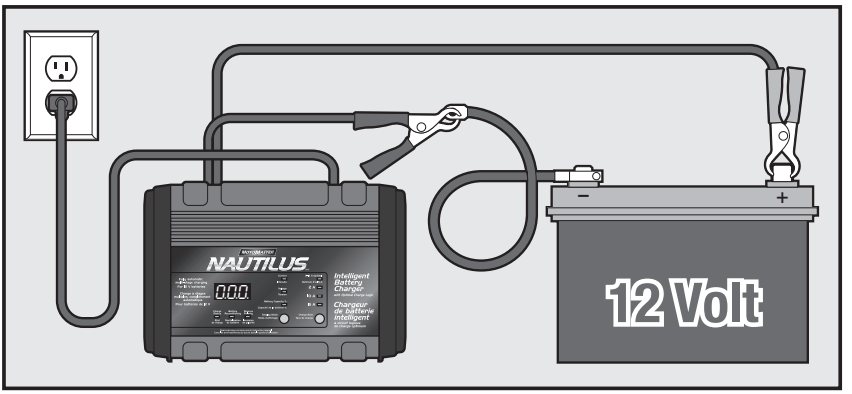
⚠ WARNING

A SPARK NEAR A BATTERY MAY CAUSE A BATTERY EXPLOSION.

NOTE: *A marine battery installed in a boat must be removed and charged on shore. To charge it on board requires equipment specially designed for marine use.*

10 CHARGING YOUR BATTERY

Using this battery charger is extremely simple. The built-in micro-processor was designed to seamlessly work with all types of 12 V lead-acid batteries so you don't need to select whether your battery is conventional, low maintenance, maintenance-free, deep cycle, Gel Cell or AGM.



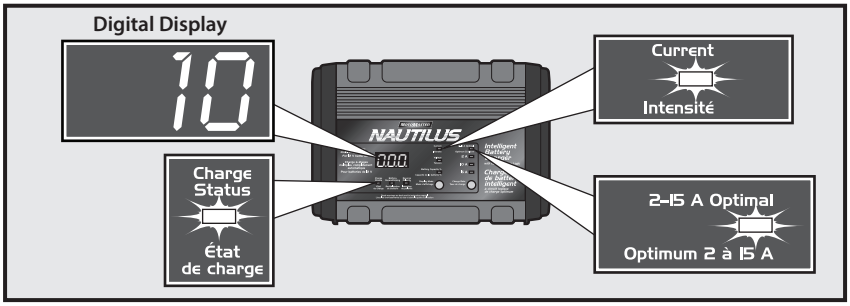
IMPORTANT NOTE: If your charger detects ANY problems with the battery you are attempting to charge, it WILL show a fault code in the Digital Display and WILL NOT begin charging automatically.

Sometimes the charger detects a problem with old/defective batteries and will flash the **888** Fault Code in the Digital Display.

Refer to the Troubleshooting/Fault Codes chart (pages 18-19) for causes and solutions for ALL fault codes (888, F01-F06).

Normal Operation

If the battery you are charging is in good condition and is properly connected to the charger you will see the following on your charger's display panel:



DIGITAL DISPLAY
The charger will be continuously monitoring the condition of the connected battery and may display charging failures as fault codes on the digital display. See **"Troubleshooting/Fault Codes"** chart (page 18 and 19) for possible causes and solutions.

CHARGE STATUS LED
A blinking green LED indicates that the battery is being charged. A solid green LED indicates that the battery is fully charged or that the charger is in **Maintenance** mode. The digital display will also show a **FUL** message, and the charger will switch to Maintenance mode.

CURRENT LED
The charger always begins in the Current mode with the corresponding LED on and the Digital Display showing the charging current.

2-15 A OPTIMAL CHARGE
The charger always begins in the **Optimal Charge** mode with the corresponding LED on, indicating the charger is charging the battery in this mode.

Other LEDs

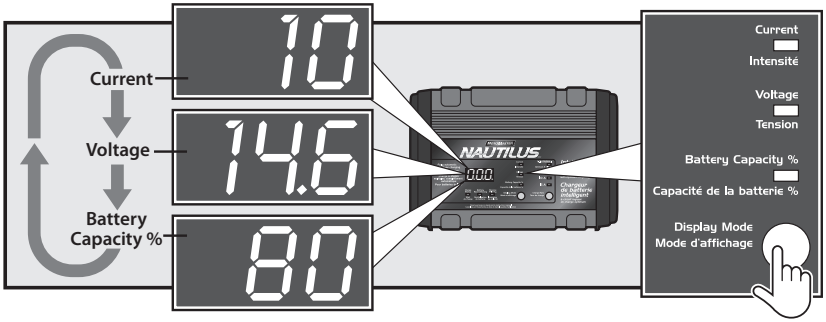
During the initial operations (Normal Operation) your charger **MAY** detect your battery needs "reconditioning" or, that you have the charger's (+/-) cables connected to the wrong terminals on your battery. The following LEDs will light to indicate what your charger has detected:

BATTERY RECONDITIONING LED
If the charger detects a sulphated battery, it will automatically activate the **Battery Reconditioning** mode, indicated by a blinking yellow LED. If a battery is left discharged for an extended period of time, it could become sulphated, unable to accept a charge. Reconditioning mode may help reverse the effects of sulphation and restore a battery's ability to accept a charge. If successful, normal recharging will resume after the battery is desulphated. If the first attempt at desulphation is unsuccessful, the battery charger will make up to four more attempts with about 4-5 hours each time. If still unsuccessful at desulphating the battery, fault code **F01** will be displayed indicating battery will not accept a charge and should be replaced.

REVERSE POLARITY LED
If the cables are incorrectly connected to the battery, the **Reverse Polarity** indicator will illuminate. ***Note:*** *Charger will not begin charging if the* ***Reverse Polarity*** *indicator is lit.*

Changing Display Modes

The charger starts up in the **Current** mode with the digital display showing the charging current. Pressing the **Display Mode Button** will allow you to cycle through to the other modes **(Voltage and Battery Capacity %)** and the LEDs will indicate which mode the charger is in while the **Digital Display** will indicate the corresponding levels for each mode.



CURRENT MODE
This mode shows the charging current being used by the charger in the digital display and not the charge rate selected. The charger detects and delivers the correct amount of amperage needed to charge the connected battery.

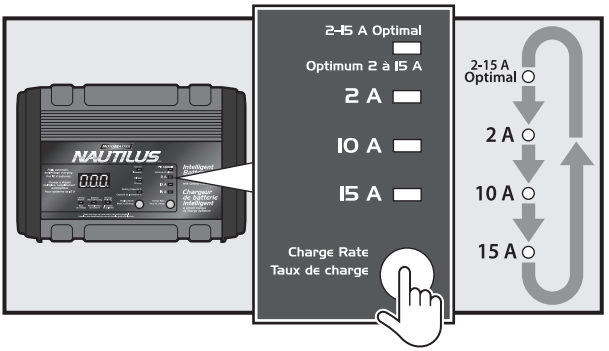
VOLTAGE MODE
This mode will show the charging voltage in the digital display that is usually higher than the battery's resting voltage.

BATTERY CAPACITY % MODE
This mode will indicate the approximate percent the battery is charged on the digital display.

- At less than 50% battery capacity, the display will read **LO**.
- The display will increase in 10% increments between 50% to 90% capacity.
- At full charge, the display will read **FUL**.

Changing Charging Rates

The charger starts up in the **Optimal Charge** mode. Pressing the **Charge Rate Button** will allow you to cycle through to the other charge rates **(2-15 A , 10 A, 15 A, 2 A**).



Understanding Charge Rates

- **2-15 A Optimal Charge**–To help extend the life of your battery and ensure it is delivering its maximum potential, it is important to charge the battery at a rate that is appropriate and safe for its capacity. Charging a battery at too high a charge rate, while fast, may shorten the expected life of a battery. Charging a battery at too low a charge rate, while safer, takes longer and does not ensure the battery will reach 100% of its capacity. Optimal charge logic automatically selects the ideal charge rate for your battery.

- **2 A Charge Rate**–Use for charging motorcycle, ATV, snowmobile, personal watercraft, garden tractor and golf cart batteries.

- **10 A and 15 A Charge Rate**–Use for faster charging of small-to-large capacity automotive, marine, deep cycle, and farm tractor batteries.

Understanding Charge Rate Times

The built-in intelligent micro-processor will continuously monitor and adjust the charger to provide a fast, safe and efficient charge. Note that battery charge times will vary depending on several factors including:

1. **Battery State** – If a battery has been only slightly discharged, it can be charged in less than a few hours. This same battery could take up to 10 hours if very discharged.
2. **Battery Rating** – A higher rated battery will take longer to charge than a lower rated battery under the same conditions. A battery is rated in ampere-hours (Ah), reserve capacity (RC), and cold-cranking amps (CCA).
3. **Charge Rate** – The charge rate is measured in amps. A battery charged at a lower rate will take longer than a battery charged at a higher rate. However, smaller batteries can be easily damaged by charging at a rate which is too high for the capacity of the battery.
4. **Temperature** – Cold temperatures will affect a battery's ability to accept a charge. Charging in cold temperatures will increase the amount of time required to charge a battery.

Other Features

MAINTENANCE MODE

Once charging is complete, the charger will automatically go into **Maintenance** mode (also known as Float Mode Monitoring). In this mode, the charger keeps the battery fully charged by delivering a small amount of current. After switching to the **Maintenance** mode, the charger will limit the charging current to avoid the risk of overcharging.

ABORTED CHARGES

If charging can not be completed normally, charging will be aborted. The digital display may show a fault code. To reset the charger after an aborted charge, disconnect the battery or unplug the charger.

BATTERY DIAGNOSTICS

The charger continuously monitors battery condition and may report certain charging failures as fault codes. Refer to the section called "Troubleshooting/Fault Codes" for a complete list.

Other Features (cont'd)

COOLING FAN OPERATION
The charger is designed to control its high-speed cooling fan for efficient operation. Consequently, it is normal for the fan to start and stop during charging.

OVERHEAT PROTECTION
The charger is designed to shut itself off if overheating is detected. Once the charger cools down, it will resume charging automatically.

TROUBLESHOOTING/FAULT CODES

Fault Code	Condition	Possible Cause	Solution
	The charger does not detect a battery connected to it.	Charger does not recognize the battery.	Connect battery to charger **BEFORE** connecting charger to AC power.
		Poor clamp connection.	Ensure battery posts are clean. Rock clamps back and forth on battery posts to ensure a good connection.
		Battery voltage is under 1.5 V (battery must have a MINIMUM of 1.5 V to activate charger).	Check battery voltage with a volt meter. If **LESS** than 1.5 V replace battery. (A battery with less than 1.5 V is likely beyond salvage due to extreme sulphation or some other internal failure.) You may try to boost the battery using booster cables connected to another vehicle. This may raise the battery voltage above 1.5 V allowing the battery charger to activate.
	The battery voltage is less than 10 V after 10 minutes of charging.	The battery is defective.	Replace the battery.
		A load may be connected to the battery.	**DO NOT** use the battery during charging.
	Battery voltage is too high.	Battery rated above 12 V.	Confirm that the battery is rated 12 V or below.

TROUBLESHOOTING/FAULT CODES (cont'd)

Fault Code	Condition	Possible Cause	Solution
	Actual charge rate exceeds selected charging rate.	A load may be connected to the battery.	Disconnect the load and attempt to charge again.
		Charging error or defective charger.	Disconnect the battery and the AC power, attempt to charge again.
	The temperature of the charger is too high.	High ambient temperature or poor ventilation.	Ensure adequate ventilation. The charger will resume charging after cooling.
	The battery does not go into **Maintenance** mode after being charged for 24 hours. ***Note:*** *When F05 appears, disconnect the battery and AC power, reconnect and attempt to charge again.*	The charge current is too low.	Select a higher charge rate.
		There is a load placed on the battery while charging.	**DO NOT** use the battery during charging.
		Battery is defective and will not accept a charge.	Replace battery.
	Reverse polarity.	The battery clamps are incorrectly connected.	Disconnect clamps and ensure proper connection.

MAINTENANCE AND CARE

- Clean cords and clamps each time you are finished using the charger.
- Wipe off any battery fluid or debris that might have come in contact with the clamps to prevent corrosion.
- Store the power and output cable neatly to prevent damage.
- Occasional cleaning of the battery charger case with a soft cloth will help protect the finish.
- **ALWAYS** unplug the charger when not in use.
- Keep the charger stored in a cool, dry place.

LIMITED WARRANTY

This MotoMaster Nautilus product carries a three (3) year warranty against defects in workmanship and materials. At its discretion, MotoMaster Canada agrees to have any defective part(s) repaired or replaced free of charge, within the stated warranty period, when returned by the original purchaser with proof of purchase. This product is not guaranteed against wear or breakage due to misuse and/or abuse.