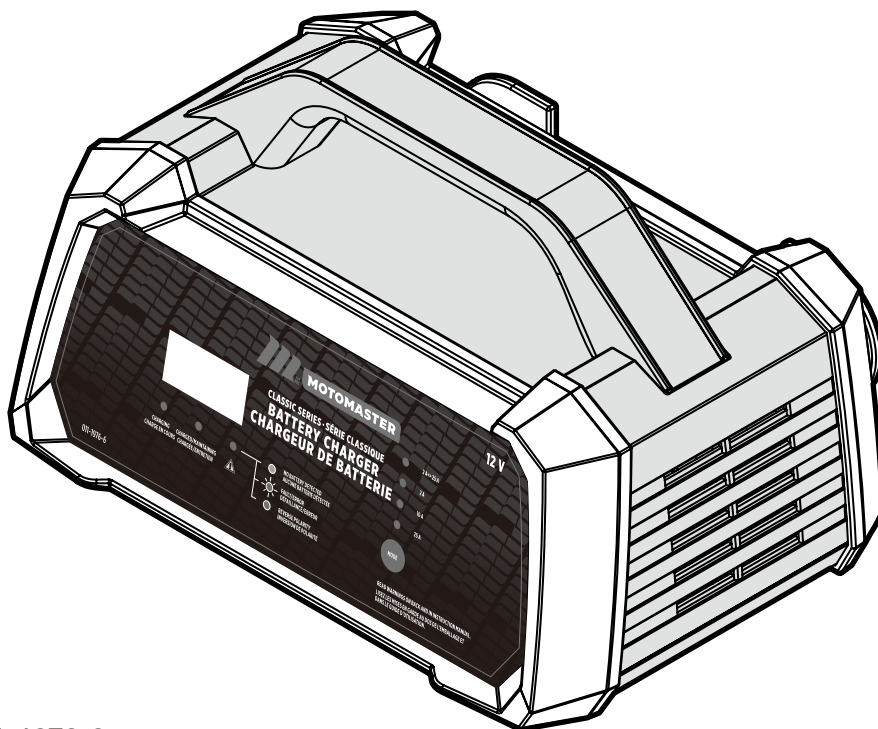




MOTOMASTER

Classic Series Battery Charger



Model no. 011-1976-6

IMPORTANT SAFETY INSTRUCTIONS.

SAVE THESE INSTRUCTIONS.

This manual contains important safety and operating instructions.

**INSTRUCTION
MANUAL**

Model no. 011-1976-6 Questions? Contact us 1-888-942-6686

**IF ANY PARTS ARE MISSING OR DAMAGED, OR IF YOU HAVE ANY QUESTIONS,
PLEASE CALL OUR TOLL-FREE HELPLINE AT 1-888-942-6686.**



Read and understand this instruction manual thoroughly before using the product. It contains important information for your safety as well as operating and maintenance advice.

Keep this instruction manual for future use. Should this product be passed on to a third party, this instruction manual must be included.



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This MotoMaster 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.



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INTRODUCTION

This MotoMaster® Classic Series Battery Charger features advanced technology that makes battery charging **faster, easier, and safer** while helping to **maximize the performance and life of your batteries**.

This battery charger is designed for use on **all types of 12-volt lead-acid batteries** including Wet (flooded), Maintenance-free (MF), Calcium (Ca), Enhanced Flooded (EFB), Absorbed Glass Mat (AGM), and Gel. It is suitable **for charging batteries rated from 10 to 200 Amp-hours and maintaining batteries from 10 to 400 Amp-hours**.

This manual will explain how to use the charger safely and effectively. Please read and follow these instructions and precautions carefully.

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS.

- Read all instructions, warning, and cautions printed on the battery charger, battery and vehicle or equipment using battery.
- **DO NOT** expose charger to rain or snow.
- Use of an attachment not recommended or sold by the battery charger manufacturer may result in a risk of fire, electric shock, or injury to persons.
- To reduce risk of damage to electric plug and cord, pull by plug rather than cord when disconnecting charger.
- An extension cord should not be used unless absolutely necessary.
Use of an improper extension cord could result in a risk of fire and electric shock. If an extension cord must be used, make sure:
 - The pins on plug of extension cord are the same number, size, and shape as those of plug on charger.
 - The extension cord is properly wired and in good electrical condition.
 - The wire size is large enough for the AC ampere rating of the charger, as specified in the chart on the following page.
- **DO NOT** operate charger with damaged cord or plug—replace the cord or plug immediately.
- **DO NOT** operate charger if it has received a sharp blow, been dropped, or otherwise damaged in any way—take it to a qualified serviceman.
- **DO NOT** disassemble the charger. Take it to a qualified service professional if service or repair is required. Incorrect assembly may result in fire or electric shock.



- To reduce risk of electric shock, unplug charger from outlet before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.

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 UTMOST IMPORTANCE THAT YOU FOLLOW THE INSTRUCTIONS EACH TIME YOU USE THE CHARGER.
- To reduce risk of battery explosion, follow these instructions and those published by battery manufacturer and manufacturer of any equipment you intend to use in the vicinity of the battery. Review cautionary markings on these products and on engine.

PERSONAL SAFETY INSTRUCTIONS.

- Consider having someone close by to come to your aid when you work near a lead-acid battery.
- Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
- Wear complete eye protection and clothing protection. Avoid touching eyes while working near battery.
- If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eyes, immediately flood eyes with running cold water for at least 10 minutes and get medical attention immediately.
- **NEVER** smoke or allow a spark or flame in vicinity of battery or engine.
- Take extra precautions to avoid dropping a metal tool onto the battery. It may spark or create a short circuit that can cause an explosion.
- Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a lead-acid battery. A lead-acid battery can produce a short-circuit current high enough to weld a ring or the like to metal, causing a severe burn.
- Use charger for charging a LEAD-ACID battery only. It is not intended to supply power to a low voltage electrical system other than in a starter-motor application. Do not use battery charger for charging dry-cell batteries that are commonly used with home appliances. These batteries may burst and cause injury to persons and damage to property.
- **NEVER** charge a frozen battery.

AC ELECTRICAL CONNECTIONS**PLUGGING CHARGER IN**

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

USING AN EXTENSION CORD

An extension cord should not be used unless absolutely necessary. Use of an improper extension cord could result in a risk of fire and electric shock. If an extension cord must be used, make sure:

- The pins on plug of extension cord are the same number, size, and shape as those of plug on charger.
- The extension cord is properly wired and in good electrical condition.
- The wire size is large enough for AC ampere rating of charger as specified in the chart below:

MINIMUM RECOMMENDED EXTENSION CORD

Length of Cord, Metres (Feet)	AWG* Size of Cord
7.6 (25)	16
15.2 (50)	14
30.5 (100)	10
45.6 (150)	8

*AWG = American Wire Gauge



PREPARING TO CHARGE

- If it is necessary to remove battery from vehicle to charge, always remove grounded terminal from battery first. Make sure all accessories in the vehicle are off so as not to cause an arc.
- Be sure area around battery is well ventilated while battery is being charged.
- Clean battery terminals. Be careful to keep corrosion from coming in contact with eyes.
- Add distilled water in each cell until battery acid reaches level specified by battery manufacturer. Do not overfill. For a battery without removable cell caps, such as valve-regulated lead-acid batteries, carefully follow manufacturer's recharging instructions.
- Study all battery manufacturer's specific precautions while charging and follow recommended rates of charge.
- Determine voltage of battery by referring to car owner's manual and make sure that output voltage selector switch is set at correct voltage. If charger has adjustable charge rate, charge battery initially at lowest rate.

CHARGER LOCATION

- Locate charger as far away from battery as DC cables permit.
- Never place charger directly above battery being charged; gases from battery will corrode and damage charger.
- Never allow battery acid to drip on charger when reading electrolyte specific gravity or filling battery.
- Do not operate charger in a closed-in area or restrict ventilation in any way.
- Do not set a battery on top of charger.

DC CONNECTION PRECAUTIONS

- Connect and disconnect DC output clips only after removing AC cord from electrical outlet. Never allow clips to touch each other.
- Attach clips to battery and chassis as indicated in the Connecting Your Battery section.

CONNECTING YOUR BATTERY

FOLLOW THESE STEPS WHEN BATTERY IS INSTALLED IN VEHICLE

WARNING: A SPARK NEAR THE BATTERY MAY CAUSE A BATTERY EXPLOSION. TO REDUCE THE RISK OF A SPARK NEAR THE BATTERY:

- Position AC and DC cords to reduce risk of damage by hood, door or moving engine part.
- Stay clear of fan blades, belts, pulleys, and other parts that can cause injury to persons.
- Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has a larger diameter than NEGATIVE (NEG, N, -) post.
- Determine which post of battery is grounded (connected) to the chassis.
If negative post is grounded to chassis (as in most vehicles), see step "For negative-grounded vehicle". If positive post is grounded to the chassis, see step "For positive-grounded vehicle".
- For negative-grounded vehicle, connect POSITIVE (RED) clip from battery charger to POSITIVE (POS, P, +) ungrounded post of battery. Connect NEGATIVE (BLACK) clip to vehicle chassis or engine block away from battery. Do not connect clip to carburetor, fuel lines, or sheet-metal body parts. Connect to a heavy-gauge metal part of the frame or engine block.
- For positive-grounded vehicle, connect NEGATIVE (BLACK) clip from battery charger to NEGATIVE (NEG, N, -) ungrounded post of battery. Connect POSITIVE (RED) clip to vehicle chassis or engine block away from battery. Do not connect clip to carburetor, fuel lines, or sheet-metal body parts. Connect to a heavy-gauge metal part of the frame or engine block.
- When disconnecting charger, turn switches to off, disconnect AC cord, remove clip from vehicle chassis, and then remove clip from battery terminal.

FOLLOW THESE STEPS WHEN BATTERY IS OUTSIDE VEHICLE

WARNING: A SPARK NEAR THE BATTERY MAY CAUSE A BATTERY EXPLOSION. TO REDUCE THE RISK OF A SPARK NEAR THE BATTERY:

- Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has a larger diameter than NEGATIVE (NEG, N, -) post.
- Attach at least a 24" (61 cm) 6-gauge (AWG) insulated battery cable to NEGATIVE (NEG, N, -) battery post.
- Connect POSITIVE (RED) charger clip to POSITIVE (POS, P, +) post of battery.
- Position yourself and free end of cable as far away from battery as possible—then connect NEGATIVE (BLACK) charger clip to free end of cable.
- Do not face battery when making final connection.
- When disconnecting charger, always do so in reverse sequence of connecting procedure and break first connection while as far away from battery as practical.
- A marine (boat) battery must be removed and charged on shore. To charge it on board requires equipment specially designed for marine use.

**WARNING**

A SPARK NEAR A BATTERY MAY CAUSE A BATTERY EXPLOSION!

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.

CONTROLS AND INDICATORS



A. Digital Display

During charging, the digital display will alternate between Volts (V), Amps (A) and Battery State of Charge (%). It can also display Fault Codes if a charging error is detected.

Volts—Actual charging voltage will be displayed. Charging voltage can reach up to 14.4 V— this is normal and required to effectively charge a 12-volt battery.

Amps—Actual charging amperage will be displayed. While you may select 2 A, 10 A or 25 A charge modes, these are maximum currents and the battery charger will reduce actual current delivered to the battery based on feedback from the battery and other factors.

Stage of Charge—The approximate battery state of charge is displayed. A reading of "LO" indicates that the battery is below 50% state of charge. Above 50%, the percentage will display in 10% increments between 60 to 90% capacity. Once the battery is fully charged, the display will read "100%".

NOTE: About 30 minutes after reaching full charge, the battery charger will enter a power-saving mode and the digital display will turn off.

Fault Codes—The charger will continuously monitor charge progress and collect feedback from the battery during charging. In the event an abnormal condition is detected, charging will stop and a fault code (e.g., "F01") may be displayed. (See "Troubleshooting/Fault Codes" for possible causes and solutions.)

NOTE: A fault condition will also be indicated by the  LED illuminating.

B. Charge Status Indicators

CHARGING LED—Indicates battery is charging.

CHARGED/MAINTAINING LED—Indicates charging is complete and the battery charger has entered the Maintain stage. (See Understanding Charging Stages.)

 **LED**—Indicates one of three possible error conditions:



- Amber (solid)—No battery detected. Check to ensure that clamp connections to the battery posts are clean and solid. If connections are good, the battery is severely discharged (<1.5 V) and may be unsafe to charge. The battery should be tested or replaced.
- Red (flashing)—A fault has been detected and charging has been aborted. Check the digital display for a Fault Code and see "Troubleshooting/Fault Codes" for possible causes and solutions.
- Red (solid)—Reverse polarity has been detected. Reverse clamp connections.

C. Charging Modes

There are 4 charging modes to choose from. Pressing the MODE button repeatedly will cycle through each of the charge modes. See below for an overview of each mode. Charging will automatically begin about 5 seconds after the charge mode has been selected.

NOTE: The battery charger will retain the last selected mode in memory. In the event AC power is disrupted (e.g., power failure), the charger will re-start in the last selected mode once power is restored.

MODE	EXPLANATION	Battery Capacity Range	
		Charging	Maintenance
2 A<>25 A	For charging most sizes of 12 V lead-acid batteries. Select this mode if you are unsure about the capacity rating of your battery*.	10 to 400 Amp-hour	10 to 400 Amp-hour
2 A	For charging small to medium 12 V lead-acid batteries.	10 to 50 Amp-hour	10 to 400 Amp-hour
10 A	For charging medium to large 12 V lead-acid batteries.	30 to 200 Amp-hour	30 to 400 Amp-hour
25 A	For faster charging of large 12 V batteries or charging extra large ones.	80 to 400 Amp-hour	80 to 400 Amp-hour
<p>*About the 2 A<>25 A mode—To help a battery delivery its maximum performance and lifespan, it is important to charge it at a rate that is appropriate and safe for its capacity. Charging a battery at too high a charge rate, while fast, can overheat a battery and shorten its expected life. Conversely, charging a battery at too low a charge rate, while safer, can take unnecessarily long and can even result in the battery never truly reaching full charge. In the "2 A<>25 A" mode, the charger starts charging at a low, safe current and gradually increases the rate as the battery demonstrates it can accept a higher current. The result is a balance between shortest charging time and safely charging a battery to its utmost capacity.</p>			

Examples of Battery Sizes in Common Applications	
Small (10–25 Ah)	Motorcycle, scooter, ATV, personal watercraft, snowmobile.
Medium (30–50 Ah)	Compact car, mid-size sedan, compact SUV, riding mower, UTV.
Large (60–100 Ah)	Full-size car, large SUV, truck, boat, RV, farm tractor.
Extra large (100 Ah+)	Large marine, tractor trailer, bus, multiple batteries connected in a bank.
For reference only. Please check the specifications listed on your battery or consult with the battery manufacturer.	

CHARGING YOUR BATTERY

1. Connect the charger clamps to the battery (following the steps outlined in “Connecting Your Battery”).
2. Plug the charger AC plug into an electrical outlet.
NOTE: If a fault or error is detected, the ⚠ LED will illuminate (see Charge Status Indicators).
3. Press the MODE button to select a charging program.
NOTE: If no selection is made within 5 seconds, the charger will default to the last selection in memory and automatically begin charging.
4. Your battery is fully charged when the CHARGED/MAINTAINING LED illuminates and the display reads "100%".
NOTE: Your battery is ready to start an engine once it reaches 80%.
5. Stop charging at any time by disconnecting the charger AC plug from the electrical outlet.

UNDERSTANDING FACTORS THAT AFFECT CHARGING TIME

The time it takes to fully recharge a battery depends on several factors including:

1. Battery Depth of Discharge

The greater the depth of discharge, the longer it will take to fully charge a battery. For example, a battery discharged to a level of 50% will take about twice as long to fully charge than a battery discharged only 25%.

2. Battery Size

If charged at the same current, a larger (higher capacity) battery will require more time to fully charge than a smaller (lower capacity) battery. This difference can be overcome by charging larger batteries at a higher current.

3. Battery Age and Condition

As a battery ages, its internal resistance will increase, impacting its ability to accept current. This effect is particularly noticeable in batteries that have not been well-maintained over their life.

4. Battery Type

Some battery chemistries, such as AGM and gel, have lower internal resistance which means they can accept charge better without generating damaging heat. Such batteries can charge up to 2 times faster than traditional wet battery types.

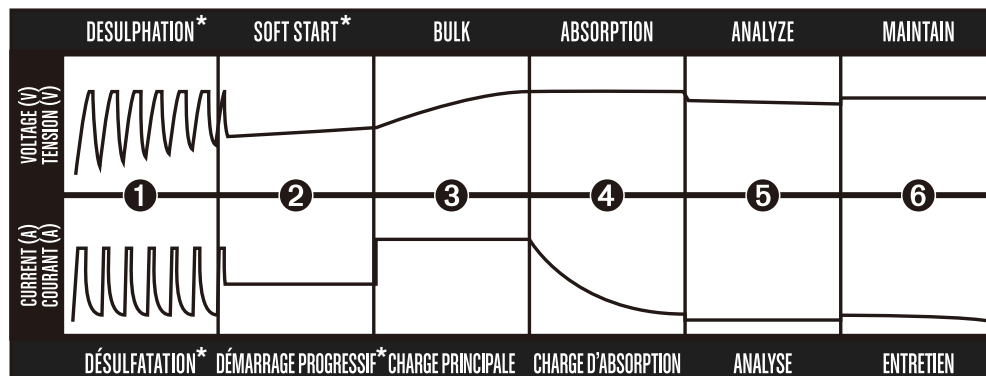
5. Charge Rate

The charge rate is measured in amperes (A). A battery charged at a lower rate will take longer to fully charge than a battery charged at a higher rate. This does not mean that one should always charge a battery at the highest ampere available as this can cause overheating and premature battery failure. A battery should be charged at a rate appropriate for its size—a good, safe rule of thumb is about $1/10^{\text{th}}$ its Amp-hour capacity (e.g., 100 Ah battery $\times 1/10 = 10$ A).

6. Cold Temperature

Cold temperatures slow down the chemical reaction that takes place inside a battery when it is charging. Charging a battery at a cold temperature can greatly increase the amount of time required to charge the battery. Ideal charging temperature is between 10 to 25°C (50 to 77°F).

UNDERSTANDING THE MULTI-STAGE CHARGING PROCESS



STAGE 1 DESULPHATION*

Pulses of voltage and current help recover sulphated or deeply discharged batteries.

STAGE 2 SOFT START*

Gently introduces current to condition deeply discharged batteries and prevent overheating that could damage the battery.

STAGE 3 BULK

Charging with maximum current to bring the battery to about 80% capacity.

STAGE 4 ABSORPTION

Charging with constant voltage while reducing current to safely bring the battery to 100% capacity. This stage is key to maximizing battery performance and battery life.

STAGE 5 ANALYZE

Tests if battery is holding charge.

STAGE 6 MAINTAIN

Monitors battery voltage and provides top-up charging when necessary to keep battery fully charged

* If necessary

MAINTENANCE AND CARE

- Wipe clean cords and clamps after each use.
- Store the power and output cables neatly to prevent damage.
- The charger housing may be cleaned using a damp cloth and mild cleaning agent.
- Always unplug the charger when not in use.
- Keep the charger stored in a cool, dry place.

TROUBLESHOOTING/FAULT CODES

Error Code	Condition	Cause	Solution
888	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.
F01	The battery voltage is less than 10 V after some time charging.	The battery is defective.	Replace the battery.
		A load may be connected to the battery.	Do not use the battery during charging.
F02	Battery voltage is too high.	Battery is not a 12 V battery.	Confirm that the battery is 12 V, not 24 V.
F03	Actual charge rate exceeds selected charging rate.	A load may be connected to the battery.	Disconnect the load and attempt to charge again.
		Charger error.	Disconnect the battery and the AC power; attempt to charge again.
F04	The temperature of the charger is too high.	High ambient temperature or poor ventilation.	Ensure adequate ventilation. The charger will resume charging after cooling.

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Error Code	Condition	Cause	Solution
F05	The battery does not go into Maintenance mode after being charged for 24 hours. Note: When F05 appears, disconnect AC power and remove clamps from battery. Re-connect and attempt to charge again.	The charge current is too low.	Try charging battery again using a higher charge rate.
		There is a load placed on the battery while charging.	Remove any loads connected to the battery during charging.
		Battery is defective and will not accept a charge.	Replace battery.
F06	Reverse polarity.	The battery clamps are incorrectly connected.	Reverse clamp connections.

TECHNICAL SPECIFICATIONS

Input Voltage AC	120 V AC, 60 Hz
Working Voltage AC	104 –127 V AC, 60 Hz
Input Amps	10 A (max.)
Charging Voltage	14.4 V
Charging Current	2/10/25 A
Minimum Battery Voltage	1.5 V
Ambient Operating Temperature	-20 to 40°C (-4 to 104°F).
Charger Type	6-step, fully automatic
Compatible Battery Voltage	12 V (nominal)
Compatible Battery Types	All lead-acid (Wet, MF, Ca, AGM and Gel)
Compatible Battery Capacities	Charging: 10 to 400 Amp-hour Maintenance: 10 to 400 Amp-hour
Dimensions (L x W x H)	11 7/16 x 8 11/16 x 6 1/2" (29 x 22 x 16.5 cm)
Weight	4 lb 3 oz (1.9 kg)

Made in China
Imported by MotoMaster Canada,
Toronto Canada M4S 2B8