model no. 011-1505-8

MOTOMASTER 1933

TM/MC

BATTERY CHARGER

IMPORTANT:
This manual contains important safety and operating instructions.
Read all instructions and follow them when using this product.

INSTRUCTION MANUAL

DO NOT RETURN THIS PRODUCT TO THE STORE! QUESTIONS? CALL CUSTOMER SERVICE, HOTLINE: 1-800-528-6817.

This MotoMaster® product carries a two (2) 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.

Imported by MotoMaster® Canada, Toronto, Canada M4S 2B8

TECHNICAL SPECIFICATIONS

Input voltage	120 V AC
Input frequency	60 Hz
Input current	3 A charging 18 A engine start
Output voltage	6 V/12 V DC
Output current	2 A/6 V DC 2 A/12 V DC 15 A/12 V DC 100 A engine start
Power cord	6’ (1.8 m)

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Before using your MotoMaster® battery charger, be sure to read and save these safety instructions. Failure to do so could result in serious injury or death.

Abbreviations and Acronyms	
A	Amp (Ampere)
AC	Alternating current
DC	Direct current
Ah	Amp-hour
mA	Milliampere
cm	Centimetre
mm	Millimetre
V	Volt

IMPORTANT SAFETY INSTRUCTIONS

- SAVE THESE INSTRUCTIONS. This manual contains important safety and operating instructions.
- Keep out of reach of children.
- **DO NOT** expose the 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, or damage to property.
- To reduce the risk of damage to the electric plug or cord, pull by the plug rather than by the cord when disconnecting the 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 that:
  - i. The pins on the plug of the extension cord are the same number, size and shape as those of the plug on the charger.
  - ii. The extension cord is properly wired and in good electrical condition.
  - iii. The wire size is large enough for the AC ampere rating of the charger.
- **DO NOT** operate the charger if it has received a sharp blow, been dropped, or damaged. Take it to a qualified service person.

PERSONAL PRECAUTIONS

- **NEVER** smoke or allow a spark or flame in the vicinity of a battery or engine.
- 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, causing a severe burn.
- This charger employs parts, such as switches and circuit breakers, that tend to produce arcs and sparks. If used in a garage, place this charger 18” (46 cm) or more above floor level.
- Use this charger for charging 6 V and 12 V

WARNING!
DO NOT operate the charger with a damaged cord or plug. Have the cord or plug replaced immediately by a qualified service person.

WARNING! ELECTRIC SHOCK HAZARD

- To reduce the risk of electric shock, unplug the charger from the outlet before attempting any maintenance or cleaning. Simply turning off the controls will not reduce this risk.
- DO NOT disassemble the charger. Take it to a qualified service person when service or repair is required. Incorrect reassembly will result in a risk of fire or electric shock.

lead-acid batteries only. It is not intended to supply power to a low voltage electrical system other than in a motor-starting application.

- **NEVER** charge a frozen battery.
- **NEVER** overcharge a battery.
- Consider having someone nearby to come to your aid when you work near a lead acid battery.
- Battery acid is a highly-corrosive sulfuric acid. Have plenty of fresh water and soap nearby in case battery acid comes into contact with your skin, clothing or eyes.
- Wear complete eye and body protection, including safety goggles and protective clothing. Avoid touching your eyes while working near the battery.
- If battery acid comes into contact with your skin or clothing, immediately wash the area with soap and water. If acid enters your eye, immediately flood the eye with cold running water for at least 10 minutes and seek medical attention right away.
- If battery acid is accidentally swallowed, drink milk, the whites of eggs or water. Do not induce vomiting. Seek medical attention immediately.

PREPARING TO CHARGE

- If it is necessary to remove the battery from the vehicle to charge it, always remove the grounded terminal first. Make sure all of the accessories in the vehicle are off to prevent arcing.
- Be sure the area around the battery is well-ventilated while the battery is being charged.
- Clean the battery terminals before charging the battery. During cleaning, keep airborne corrosion from coming into contact with your eyes, nose and mouth. Use baking soda and water to neutralize the battery acid and help eliminate airborne corrosion. **DO NOT** touch your eyes, nose or mouth.
- Add distilled water to each cell until the battery acid reaches the level specified by the battery manufacturer. Do not overfill. For a battery without removable cell caps, such as valve-regulated lead-acid batteries (VRLA), carefully follow the manufacturer's recharging instructions.
- Read, understand and follow all instructions for the charger, battery, vehicle and any equipment used near the battery and charger. Study the entire battery manufacturer's specific precautions while charging, and understand the recommended rates of charge.
- Determine the voltage of the battery by referring to the vehicle's owner's manual. If the charger has an adjustable charge rate, charge the battery at the lowest rate first.
- Make sure that the charger cable clips are tightly connected to the battery posts.

WARNING! EXPLOSION HAZARD

- Working in the vicinity of a lead-acid battery is dangerous. Batteries generate explosive gases during normal operation. For this reason, it is important that you follow the instructions each time you use the charger.
- To reduce the risk of a battery explosion, follow the instructions and those published by the battery manufacturer and the manufacturer of any equipment you intend to use in the vicinity of the battery. Review the cautionary markings on these products and on the engine.
- DO NOT drop a metal tool onto the battery. It could cause a spark or short-circuit the battery or other electrical part which could cause an explosion.
- DO NOT use this 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.

CHARGER LOCATION

- Place the charger as far away from the battery as the DC cables permit.
- **NEVER** place the charger directly above the battery being charged; gases from the battery will corrode and damage the charger.
- **DO NOT** set the battery on top of the charger.
- **DO NOT** set the battery charger on flammable items, such as carpeting, upholstery, paper, cardboard, etc. The charger always generates heat and may damage leather and melt plastic or rubber.
- **NEVER** allow battery acid to drip onto the charger when reading the electrolyte specific gravity or filling the battery.
- **DO NOT** operate the charger in a closed-in area or restrict the ventilation in any way.

DC CONNECTION PRECAUTIONS

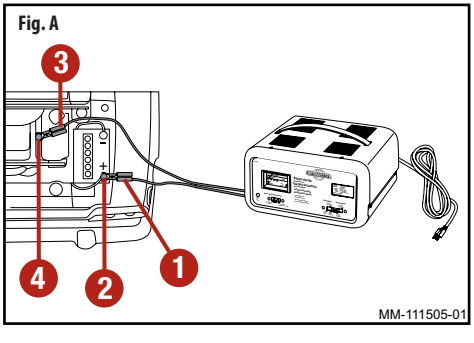
- Connect and disconnect the DC output clips only after removing the AC plug from the electrical outlet. **NEVER** allow the clips to touch each other.

FOLLOW THESE STEPS WHEN BATTERY IS INSTALLED IN VEHICLE

- Position the AC and DC cables to reduce the risk of damage by the hood, door and moving or hot engine parts.
- Stay clear of fan blades, belts, pulleys and other parts that can cause injury.
- Check the polarity of the battery posts. The positive (pos, P, +) battery post usually has a larger diameter than the negative (neg, N, -) post.
- Determine which post of the battery is grounded (connected) to the chassis. If the negative post is grounded to the chassis (as in most vehicles), see step (i). If the positive post is grounded to the chassis, see step (ii).

  i. For a negative-grounded vehicle, connect the positive (red) clip (1) from the battery charger to the positive (pos, P, +) ungrounded post (2) of the battery. Connect the negative (black) clip (3) to the vehicle chassis or engine block (4) away from the battery (see Fig. A).

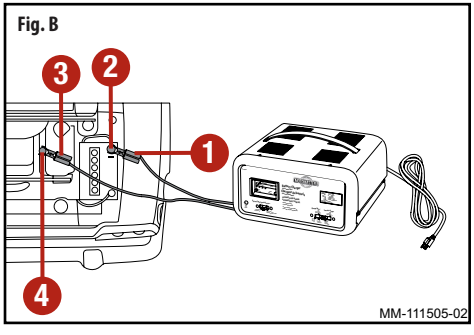
Fig. A



NOTE:
If it is necessary to close the hood during the charging process, ensure that the hood does not touch the metal part of the battery clips or cut the insulation of the cables.

ii. For a positive-grounded vehicle, connect the negative (black) clip (1) from the battery charger to the negative (neg, N, -) ungrounded post (2) of the battery. Connect the positive (red) clip (3) to the vehicle chassis or engine block (4) away from the battery (see Fig. B).

Fig. B

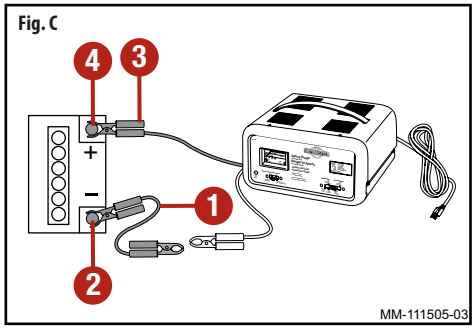


- Connect charger AC supply cord to electrical outlet.
- When disconnecting the charger, disconnect the AC cord, remove the clip from the vehicle chassis, and then remove the clip from the battery terminal.
- See CALCULATING CHARGE TIME for length of charge information.

FOLLOW THESE STEPS WHEN BATTERY IS OUTSIDE OF VEHICLE

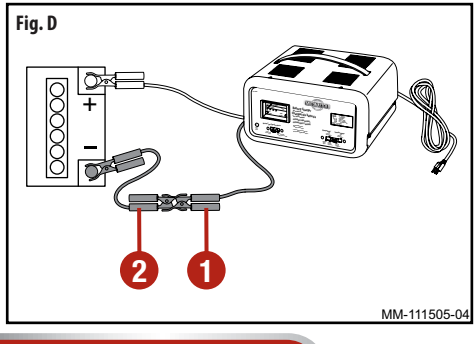
- Check the polarity of the battery posts. The positive (pos, P, +) battery post usually has a larger diameter than the negative (neg, N, -) post.
- Ensure that all of the charger components are in place and in good working condition, including the plastic boots on the battery clips.
- Attach at least a 24" (61 cm) long 6-gauge (AWG) insulated battery cable (1) to the negative (neg, N, -) battery post (2) (see Fig. C).
- Connect the positive (red) charger clip (3) to the positive (pos, P, +) post (4) of the battery (see Fig. C).

Fig. C



- Position yourself and the free end of the cable you previously attached to the negative (neg, N, -) battery post, as far away from the battery as possible, then connect the negative (black) charger clip (1) to the free end of the cable (2). Do not face the battery when making final connection (see Fig. D).

Fig. D



WARNING

- Connect the charger clip to a heavy-gauge metal part of the frame or engine block.
- DO NOT connect the charger clip to the carburetor, fuel lines or sheet-metal body parts.

- Connect charger AC supply cord to electrical outlet.
- When disconnecting the charger, always do so in the reverse order of the connecting procedure, and break the first connection while as far away from the battery as practical.

GROUNDING AND AC POWER CORD CONNECTIONS

- This battery charger is for use on a nominal 120 V circuit and has a grounded plug. The charger must be grounded to reduce the risk of electric shock. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances. The plug pins must fit the receptacle (outlet). Do not use with an ungrounded system.
- Never alter the AC cord or plug provided. If it does not fit the outlet, have a properly-grounded outlet installed by a qualified electrician. An improper connection can result in a risk of an electric shock or electrocution.
- Recommended minimum AWG size for extension cord.

Length of cord	<100' (30.5 m)	>100' (30.5 m)
AWG* size of cord	16	14

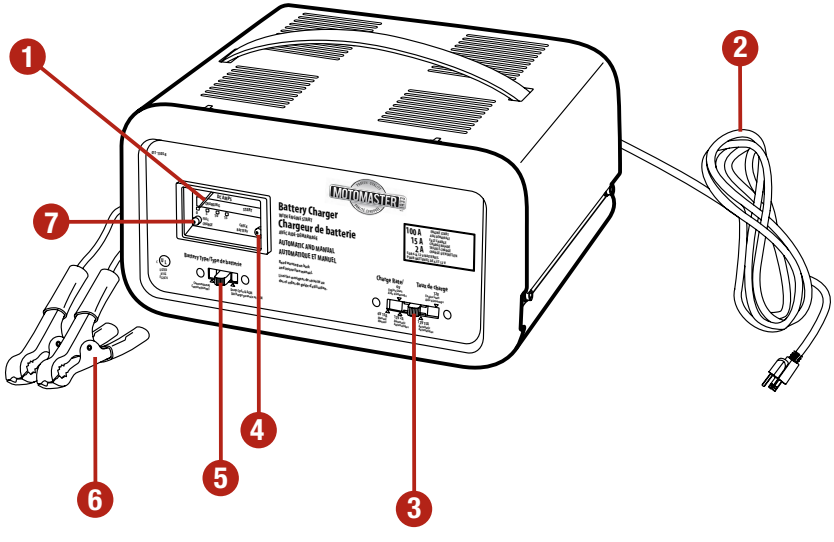
* AWG: American Wire Gauge

NOTE:

- A marine (boat) battery must be removed and charged on shore. To charge it onboard requires equipment specially designed for marine use.
- Remove all cord wraps and uncoil the cables prior to using the battery charger.
- A buzz or hum is normal when the output cables have been disconnected and the AC power cord is still connected to an electrical source (i.e. wall outlet).
- Pursuant to Canadian regulations, use of an adapter plug is not allowed in Canada.

FEATURES

1. Ammeter
2. Power cord
3. Charge rate selector switch
4. Check battery (red) LED indicator
5. Battery type selector switch
6. Battery clips
7. Full charge (green) LED indicator



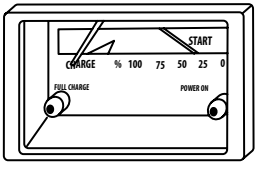
MM-111505-01

This MotoMaster® battery charger is easy to use and designed for years of reliable service. This MotoMaster® battery charger is used to charge only 6 V and12 V lead-acid batteries including deep cycle and Absorbed Glass Mat (AGM) batteries.

BATTERY CHARGER COMPONENTS

AMMETER - The ammeter 1 indicates the amount of current, measured in amps, that is being drawn by the battery. As a battery takes on a charge, it draws less current from the charger. Correspondingly, the meter will show less current is being drawn by the battery. When the current stops decreasing, the battery is charged. The 2 A charge rate may indicate some activity on the meter, although the meter does not have the resolution to display this low rate.

The START area of the meter indicates when a high rate of current is being drawn from the charger. It is normal for the meter to be on the START area while using engine start.



LED INDICATOR

CHECK BATTERY (RED) LED INDICATOR - When lit, this LED indicator 4 indicates there is something wrong with the battery. Check the DC connections for an improper connection; otherwise, the battery may be bad.

FULL CHARGE (GREEN) LED INDICATOR - When lit, this LED indicator 7 indicates that the battery is fully charged and the charger has stopped charging and has switched to the maintain mode of operation.

BATTERY TYPE SWITCH - Use this switch 5 to set the type of battery to be charged.

Conventional: These are the most common type of batteries and are usually used to start engines for cars, truck, motorcycles, etc. They are designed to deliver short, high-current bursts. These batteries have vent caps and are often marked as “low maintenance” or “maintenance-free”.

Deep-cycle and AGM: Deep cycle batteries are designed to withstand repeated discharges and are commonly used in marine and RV applications. AGM (Absorbed Glass Mat) batteries can be found in either starting or deep cycle applications. These batteries have a sealed case without vent caps. There is no free-flowing electrolyte inside these batteries. The electrolyte is absorbed into sponge-like glass mat separators.

CHARGE RATE SELECTOR SWITCH - Use this switch 3 to set the maximum charge rate to one of the following:

6 V MANUAL: Manual operation to charge medium and large size 6 V lead-acid batteries. Monitor frequently while charging a battery.

12 V 2 A AUTOMATIC/6 V ENGINE START: Intended for charging small 12 V batteries (31 Ah or less) or to warm larger lead-acid batteries. It can also be used as Engine Start to assist in engine cranking of 6 V systems.

12 V 15 A AUTOMATIC: Select 15 A automatic for a faster charge for larger 12 V batteries. Not intended for industrial applications.

12 V ENGINE START: 100 A Engine Start to assist in engine cranking of 12 V systems. Do not use for 6 V batteries.

OPERATION

MANUAL CHARGING (6 V ONLY)

When a MANUAL CHARGE is performed, the charger will continue to charge and will not shut off. You must keep a visual check on the ammeter to determine when the battery is charged. Be sure to monitor the charging process and stop it when the battery is charged. Not doing so may cause damage to your battery or result in other property damage or personal injury.

AUTOMATIC CHARGING (12 V ONLY)

When an AUTOMATIC CHARGE is performed, the charger automatically switches to the maintain mode once the battery is charged.

When the FULL CHARGE (green) LED is lit, the charger has stopped charging and switched to the maintain mode of operation.

MAINTAIN MODE

When the FULL CHARGE (green) LED is lit, the charger has started maintain mode. In this mode, the charger keeps the battery fully charged by delivering a small current, when necessary. If the battery voltage drops below a preset level, the charger will go back into charge mode until the battery voltage returns to the full charge level, at which point the charger will return to maintain mode. The voltage is maintained at a level determined by the battery type selected.

Note: An automatic charger automatically switches between charge mode and maintain mode as necessary. The FULL CHARGE (green) LED will light up when the battery is at full charge and off when the voltage drops below a preset level and the charger goes into charge mode. This cycle will continue, and the FULL CHARGE (green) LED will stay on for longer periods of time as the battery becomes more fully charged. This is not applicable to manual chargers.

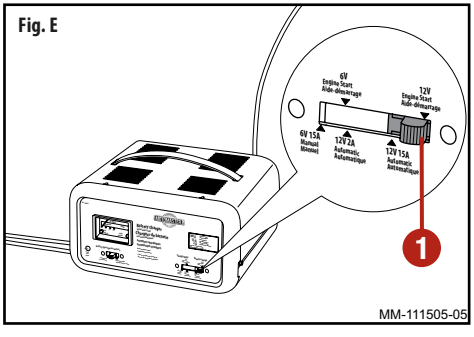
Note: The maintain mode technology utilized in this charger allows you to safely charge and maintain a healthy battery for extended periods of time. However, problems with the battery, electrical problems in the vehicle, improper connections or other unanticipated conditions could cause excessive current draws. Occasionally monitoring your battery and the charging process is recommended.

USING THE ENGINE START FEATURE

Your battery charger can be used to jump-start your car if the battery is low. Follow these instructions on how to use the ENGINE START feature.

1. With the charger unplugged from the AC outlet, connect the charger to the battery. Refer to the instructions in the safety information section.
2. Plug the charger's AC power cord into the AC outlet.
3. With the charger plugged in and connected to the battery of the vehicle, set the charge rate selector switch (1) to the appropriate ENGINE START position (6 V or 12 V) (see Fig. E).

Fig. E



IMPORTANT!
Follow all safety instructions and precautions for charging your battery. Wear complete eye protection and clothing protection. Charge your battery in a well-ventilated area.

CAUTION! EQUIPMENT DAMAGE
Using the ENGINE START feature WITHOUT a battery installed in the vehicle could cause damage to the vehicle's electrical system.

NOTE:
If you have charged the battery, and it still will not start your car, do not use the ENGINE START feature, or it could damage the vehicle's electrical system.

4. Crank the engine until it starts or 5 seconds pass. If the engine does not start, wait 4 minutes before cranking again. This allows the battery and the charger to cool down.
5. If the engine fails to start, charge the battery for 5 more minutes before attempting to crank the engine again.
6. After the engine starts, unplug the AC power cord and then disconnect the battery clips from the vehicle.
7. Clean and store the charger in a dry location.

CALCULATING CHARGE TIME

Use the following table to more accurately determine the time it will take to bring a battery to full charge.

Find your battery's rating on the chart below, and note the charge time given for each charger setting. The times given are for batteries with a 50% charge prior to recharging. Add more time for severely discharged batteries.

BATTERY SIZE/RATING			CHARGE RATE/CHARGING TIME	
			2 A	15 A
Small batteries	Motorcycle, garden tractor, etc	6 – 12 Ah	2 – 3 3/4 h	NR
		12 – 32 Ah	3 3/4 – 10 h	NR
Cars/trucks	200 – 315 CCA	40 – 60 RC	11 1/4 – 14 1/2 h	1 1/2 – 2 h
	315 – 550 CCA	60 – 85 RC	14 1/2 – 18 1/4 h	2 – 2 1/2 h
	550 – 1000 CCA	85 – 190 RC	18 1/4 – 34 3/4 h	2 1/2 – 4 1/2 h
Marine/deep-cycle		80 RC	17 1/2 h	2 1/4 h
		140 RC	27 h	3 1/2 h
		160 RC	30 h	4 h
		180 RC	33 h	4 1/2 h

CCA: Cold cranking amps.

RC: Reserve capacity.

Ah: Amp hour.

NR: Not recommended.

NOTE:

- During extremely cold weather, or if the battery is under 2 volts, charge the battery for 5 minutes before cranking the engine.
- If the engine turns over but never starts, there is not a problem with the starting system. There is a problem elsewhere in the vehicle. STOP cranking the engine until the problem has been diagnosed and corrected.

MAINTENANCE

- After use, and before performing maintenance, unplug and disconnect the battery charger.
- Use a dry cloth to wipe all battery corrosion and other dirt or oil from the battery clips, cords, and the charger case.
- Ensure that all of the charger components are in place and in good working condition, including the plastic boots on the battery clips.
- All other servicing should be performed by qualified service personnel.

STORAGE

- Store the charger unplugged, and in an upright position. The cord will still conduct electricity until it is unplugged from the power outlet.
- Store the charger inside, in a cool, dry place unless you are using an on-board marine charger.
- Do not store the clips on the handle, clipped together, on or around metal, or clipped to cables.
- If the charger is moved around the shop or transported to another location, take care to avoid/prevent damage to the cords, clips and charger. Failure to do so could result in personal injury or property damage.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
The charger is making an audible clicking sound.	• Circuit breaker is cycling.	• The settings may be wrong. Check the charger settings.
	• Battery is defective.	• Have the battery checked.
	• Shorted battery cables or clips	• Circuit breaker cycles when current draw is too high. Check for shorted cables or clips and replace if necessary.
	• Severely discharged battery, but otherwise it is a good battery.	• The battery may not want to accept a charge due to a run-down state. Allow charging to continue until battery has a chance to recover sufficiently to take a charge. If more than 20 minutes, stop charging and have the battery checked.
	• Reverse connections at battery	• Shut the charger off and correct the lead connections.
Charger makes a loud buzz or hum.	• Transformer laminations vibrate (buzz).	• No problem; this is a normal condition.
	• Shorted Diode Assembly or Output Rectifier Assembly (hum).	• Have charger checked by a qualified technician.
Charger will not turn on when properly connected.	• AC outlet is dead.	• Check for open fuse or circuit breaker supplying AC outlet.
	• Poor electrical connection	• Check power cord and extension cord for loose fitting plug.
The battery is connected and the charger is on, but is not charging.	Clips are not making a good connection.	Check for poor connection at battery and frame. Make sure connecting points are clean. Rock clips back and forth for a better connection.
The measured current is much lower than what was selected.	The charger reached the maximum voltage and is reducing the current.	No problem; this is a normal condition.

NOTE:
If the above solutions do not eliminate the problem, or for information about troubleshooting or replacement parts, call toll-free: 1-800-528-6817.

BEFORE RETURNING FOR REPAIRS

- When a charging problem arises, make certain that the battery is capable of accepting a normal charge. Double check all connections, the AC outlet for a full 120 V, the charger clips for correct polarity and the quality of the connections from the cables to the clips and from the clips to the battery system. The clips must be clean.
- When a battery is very cold, partially charged, or sulfated, it will not draw the full rated amperes from the charger. It is both dangerous and damaging to a battery to force higher amperage into it than it can effectively use in recharging.
- When an unknown operating problem arises, please read the complete manual and call the customer service number for information. This will usually eliminate the need for return.