Owner's Manual

Battery Charger Models:	**200-30 & 3010 10/30/200 AMP 6 & 12 Volt Battery Charger / Starter**

–Save–
Important Safety Instructions

Read Rules for Safe Operation and Instructions Carefully

Working in 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 each time before using your charger, you read this manual and follow the instructions exactly.

WARNING: Handling the cord on this product or cords associated with accessories sold with this product, will expose you to lead, a chemical known to the State of California to cause cancer and birth defects or other reproductive harm. ***Wash hands after handling***.

A. GENERAL BATTERY SAFETY

1. Before you use your battery charger, be sure to read all instructions and cautions printed on:
   - Battery Charger
   - Battery
   - Vehicle or unit using battery
2. Use battery charger on LEAD ACID type rechargeable batteries only, such as used in autos, trucks, tractors, airplanes, vans, RV's, trolling, motors, etc. Charger is not intended to supply power to low-voltage electrical system other than in an automotive application.
   WARNING: 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.
3. Use only attachments recommended or sold by manufacturer. Use of non-recommended attachments may result in fire, electric shock, or injury.
4. When disconnecting the battery charger, pull by the plug, not by the cord. Pulling on the cord may cause damage to cord or plug.
5. Locate battery power cord so it cannot be stepped on, tripped over, or subjected to damage or stress.
6. Do not operate charger with damaged cord or plug. Have cord replaced immediately.
7. Do not operate charger if it has received a sharp blow, been dropped, or otherwise damaged in any way. Take it to a qualified professional for inspection and repair.
8. Do not disassemble charger. Take it to a qualified professional when service or repair is required. Incorrect reassembly may result in electric shock or fire.
9. To reduce risk of electric shock, unplug charger from outlet before attempting any maintenance or cleaning.
10. Do not use an extension cord unless absolutely necessary. Use of an improper extension cord could result in fire or electric shock. If an extension cord must be used, make sure that:
    - Pins on plug of extension cord are the same number, size, and shape as those of plug on charger.
    - Extension cord is properly wired and in good electrical condition.
    - Wire size is large enough for AC ampere rating of charger, as specified below:

Length of cord (feet):	**25**	**50**	**100**	**150**
AWG size of cord:	**16**	**14**	**10**	**8**

11. Always charge battery in a well ventilated area.
    NEVER operate in a closed-in or restricted area without adequate ventilation.
    WARNING: Risk of explosive gas.
12. Locate charger as far away from battery as DC charger cables permit.
13. Do not expose charger to rain or snow.
14. **NEVER** charge a frozen battery. If battery fluid (electrolyte) is frozen, bring into a warm area to thaw before charging.
15. **NEVER** allow battery acid to drip on charger when reading specific gravity or filling battery.
16. **NEVER** set a battery on top of charger.
17. **NEVER** place charger directly above battery being charged. Gases from battery will corrode and damage charger.
18. **NEVER** touch the battery clips together when the charger is energized.

SCHUMACHER ELECTRIC CORPORATION
801 BUSINESS CENTER DRIVE • MOUNT PROSPECT, ILLINOIS 60056-2179

Send Warranty Product Repairs to: 1025 E. Thompson, Hoopeston, IL 60942-0280
Call Customer Service if you have questions: 1-800-621-5485

00-00-000380/0103

B. PERSONAL PRECAUTIONS AND SAFETY

1. **WARNING:** Wear complete eye protection and clothing protection, when working with lead-acid batteries.
2. Make sure someone is within range of your voice or close enough to come to your aid when you work with or near a lead-acid battery.
3. Have plenty of fresh water and soap nearby for use if battery acid contacts skin, clothing, or eyes. If battery acid contacts skin or clothing, wash immediately with soap and water.
4. Avoid touching your eyes while working with a battery. Acid particles (corrosion) may get into your eyes! If acid enters your eye, immediately flood eye with running cold water for at least 10 minutes. Get medical attention immediately.
5. Remove all 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.
6. Take care not to drop a metal tool or other metal onto the battery. Metal may cause sparking or short circuit the battery or another electrical device. Sparking may cause an explosion.
7. Always operate battery charger in an open well ventilated area.
8. **NEVER** smoke or allow a spark or flame in the vicinity of the battery or engine. Batteries generate explosive gases!

C. GROUND AND AC POWER CORD CONNECTIONS

Charger should be grounded to reduce the risk of electric shock.

Charger is equipped with an electric cord having an equipment grounding conductor and a grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances. This battery charger is designed for use on a nominal 120 volt circuit and has a grounded plug that looks like the plug illustrated in FIGURE 1 (A). This plug should be used in a grounded outlet. The plug pins must fit the receptacle (outlet).

ADAPTER: A temporary adapter, as shown in FIGURE 1 (B) and (C), may be used to connect the charger plug to a two pole receptacle (outlet), as shown in FIGURE 1 (B).

NOTE: The temporary adapter should be used only until a properly grounded outlet can be installed by a qualified electrician.

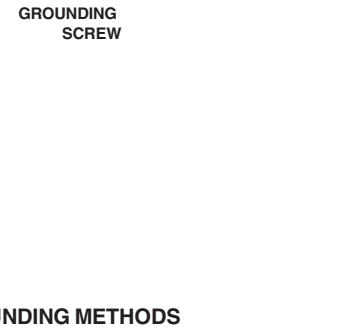


FIGURE 1 GROUNDING METHODS

DANGER: Never alter the AC cord or plug provided. If it will not fit outlet, have a proper outlet installed by a qualified electrician. Improper connection can result in a risk of an electrical shock. **DANGER:** Before using an adapter, as illustrated, be certain that the center screw of the outlet plate is grounded. The green-colored rigid ear or lug extending from the adapter must be connected to a properly grounded outlet. Make certain it is grounded. If necessary, replace original outlet cover plate screw with a longer screw that will secure adapter ear or lug to outlet cover plate and make ground connection to grounded outlet.

USE OF ADAPTER PLUG NOT ALLOWED IN CANADA

D. PREPARING TO CHARGE

1. Make sure you have a 6 volt or a 12 volt lead-acid battery. Check your car owner manual to make sure.
2. Clean battery terminals. Take care to keep corrosion from coming in contact with your eyes.
3. If required, add distilled water in each cell until battery acid reaches levels specified by battery manufacturer. This helps purge excessive gas from cells. Do not overfill. For a battery without cell caps, carefully follow manufacturer's recharging instructions.
4. Study all battery manufacturer's specific precautions, such as removing or not removing cell caps while charging, and recommended rates of charge.
5. Be sure area around battery is well ventilated while battery is being charged. Gas can be forcefully blown away by using a piece of cardboard or other non-metallic material as a fan.
6. If 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.
7. A marine (boat) battery must be removed and charged on shore. To charge it on board requires equipment specially designed for marine use.

E. CHARGER LOCATION PRECAUTIONS

Never place charger directly above the battery being charged, gases from battery could damage the charger.

Never allow battery acid to drip on the charger when reading specific gravity of filling battery.

Never operate charger in a closed in area, or restrict ventilation in any way.

Do not set battery on top of the charger.

F. OPERATING INSTRUCTIONS: CHARGING BATTERY IN VEHICLE

When charging battery in the vehicle, take care to determine the battery type and which post is grounded. To reduce risk of a spark near battery, follow these steps when battery is installed in vehicle. **WARNING: A spark near battery may cause battery explosion.**

1. Position AC power cord and DC charging cords to reduce risk of damage by hood, door, or moving engine parts.
2. Stay clear of fan blades, belts, pulleys, and other parts that can cause injury.
3. Check polarity of battery posts. Battery case will be marked by each post: **POSITIVE (POS, P, +) and NEGATIVE (NEG, N, -). NOTE:** The positive battery post usually has a larger diameter than the negative post.
4. Determine which post of battery is ground (connected) to chassis.
   NOTE: The negative post is normally grounded.

NEGATIVE GROUNDED POST

5A. 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. Connect to a heavy gauge metal part of the frame or engine block.

POSITIVE GROUNDED POST

5B. 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. Connect to a heavy gauge metal part of the frame or engine block.

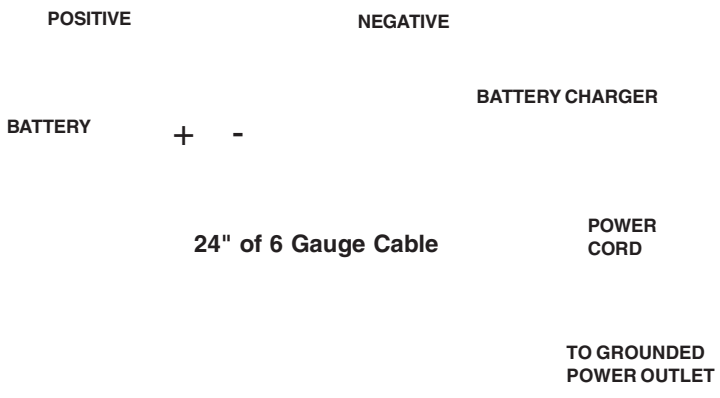
WARNING: Do not connect clip to carburetor, fuel lines, or sheet-metal body parts. **NOTE:** Attach clips to battery post and twist or rock back and forth several times to make a good connection. This tends to keep clips from slipping off terminals and helps to reduce risk of sparking.

6. Select amperage:
7. Follow steps 1-4 in Battery Charger Section K.
8. When battery is fully charged, unplug charger from AC power source.
9. Remove charger clips from (1) chassis and (2) battery pole, in that order.
10. Clean and store battery charger.

G. OPERATING INSTRUCTIONS: CHARGING BATTERY OUT OF VEHICLE

When charging battery out of vehicle, take care to determine the battery type. To reduce risk of a spark near battery, follow these steps when battery is outside vehicle. **WARNING:** A spark near the battery may cause battery explosion. **WARNING:** When removing battery from vehicle or boat, disconnect grounded pole first. When disconnecting, make sure all accessories are off, so as not to cause an arc. (**NOTE:** A marine (boat) battery must be removed and charged on shore. (To charge on board requires special equipment designed for marine use.) **WARNING:** When reinstalling battery, attach the ground post first.

1. Check polarity of battery posts. Battery case will be marked by each post: POSITIVE (POS, P, +) and NEGATIVE (NEG, N, -). **NOTE:** The positive battery post usually has a larger diameter than the negative post.
2. Attach a 24-inch long (or longer) 6-gauge (AWG) insulated battery cable to NEGATIVE (NEG, N, -) battery post.
   (The 24" lead is not supplied. You may purchase at most automotive stores.)
   The 24" lead provides a safer connection condition. Sparking or arcing could occur when connecting the charger clip to the lead.
3. Connect POSITIVE (RED) charger clip to POSITIVE (POS, P, +) post battery. Rock clip back and forth to make good connection.
4. Position yourself and free end of 24 inch cable as far away from battery as possible. Then connect NEGATIVE (BLACK) charger clip to free end of cable.
   WARNING: Do not face battery when making final connection. Rock clip back and forth to make a good connection.
5. Select amperage:
6. Follow steps 1-4 in Battery Charger Section.
7. When battery is fully charged, unplug charger from AC power source.
8. When battery is fully charged and charger is unplugged,
   (1) Remove clip from end of Negative end of cable, then
   (2) Remove clip from Positive battery post, in that order.
9. Clean and store battery charger.



WARNING: Be sure area around battery is well ventilated while battery is being charged. Gas can be forcefully blown away by using a piece of cardboard or other non-metallic material as a fan.

H. OUTPUT SELECTOR CONTROLS

Your charger is provided with a five position rotary charge rate selector switch.

Select the switch position that meets your charging needs. See description below.

Switch Position	Used for
Off	Power to battery charger transformer and battery is off.
6 Volt 30 amp charge	Delivers a 30 amp charge to a 6 volt battery.
12 Volt 10 amp charge	Delivers a 10 amp charge to a 12 volt battery.
12 Volt 30 amp charge	Delivers a 30 amp charge to a 12 volt battery.
12 Volt Engine Start	Delivers 200 amps to a 12 volt system when the Engine is cranked.

MAKE SURE THE BATTERY VOLTAGE MATCHES THAT OF THE CHARGE RATE SELECTED.

Your charger is also equipped with a *Dual self reset Circuit Breaker System.*

The first breaker is designed to interrupt a high flow of current normally developed while cranking the engine. This is the same breaker that will open when the output leads are accidentally shorted together or connected to a battery in reverse. The second breaker will open if prolonged cranking persists or for any other condition in which the output current is much greater than the 30 amp continuous rating.

THE AMMETER

The ammeter indicates the amp draw on the charger when a fully discharged battery is connected to the charger. The meter will read the maximum output rating of the charger, either 10 amps, or 30 amps depending on the amp switch selection. The charge on the 10 amp or 30 amp will gradually taper down as the battery nears full charge. As the charge current tapers, the ammeter needle will also move down. Many battery conditions can also cause the meter to appear to indicate a fully charged battery when in fact the charging has just started.

1. Cold Batteries- Start charging at a low rate of charge and as the battery warms up while charging, the charging rate will increase. After this happens, the battery will charge up and the meter will decrease normally.
2. Shorted Batteries- (battery has shorted circuit in one or more cells) The meter will usually “peg” at the high amp end of the scale. If after 5-10 minutes of charging and the needle has not started to move down scale, stop charging and have the battery checked. One way to check the battery, would be to measure the voltage at the battery terminals. If the voltage is below 12 volts on a 12 volt battery, (under 6 on a 6 volt battery), plug the charger back in and resume charging for about 15 more minutes. If the meter has failed to move towards a lower scale reading, the battery needs to be serviced or replaced.
3. Lead-Calcium batteries- When this type battery is deeply discharged, it may require an activation period before it will accept a measurable charge. (This may take as much as 6 hours before normal charging begins). You should suspect this condition if the meter indicates at or near zero, but you have determined the battery is very deeply discharged. Simply continue to charge the battery until the battery becomes activated(keep an eye on the charge every 20 minutes or so) you will see the meter indicating a higher rate of charge. This will be when the recharge of the battery commences. The battery is charged when the meter indicates about 1/2 of the selected charge rate. (about 4-5 amps on the 10 amp setting, and about 10-15 amps on the 30 amp setting).

I. ENGINE START

1. With the charger unplugged from the AC outlet, connect the charger to the battery following instructions given in section F.
2. Plug the charger AC power cord into the AC outlet, then set selector switch to the 12 volt Engine Start position.
3. Crank the engine by turning the ignition key of the vehicle. Follow the duty cycle printed on the front panel of your charger for proper ON / OFF times. During extremely cold weather or when the battery is severely exhausted, charge the battery for about 5 minutes before cranking the engine.
4. If the engine fails to start, charge the battery for 5 more minutes before attempting to crank the engine again.
5. After the engine starts, move the charge rate switch to the off position and then unplug the AC power cord from the outlet before disconnecting the output clips from the battery.

   Do not try to engine start a vehicle without a battery in it. You may damage the vehicle's system. If the engine spins, but doesn't start after several starting attempts, there is a problem with the engine of the vehicle other than its starting system. STOP cranking the engine until the other problem has been found and corrected.

J. CHARGE PERIOD

Determine the charge level of your battery with a hydrometer or electronic percent of charge tester. Determine the ampere hour rating of your battery. It may be on the battery information label. If the battery is rated in Reserve Capacity, convert to ampere hour rating using the following formula:

Ampere Hour rating = $\frac{\text{(Reserve Capacity)}}{\text{(2)}}$ + 16

Example: AH rating = $\frac{\text{(168 Reserve Capacity)}}{\text{(2)}}$ + 16 or AH = 100

Reserve Capacity is in minutes.

Use the following formula to determine the time of charge required:

(AH x % of charge needed) divided by amp setting of the charger, times 1.25 = hours of charge:

Example: **State of charge of the battery is 50%**
Percent of charge needed is 100% - 50% = 50% (.50 decimal)
Ampere rating of the battery is 100AH
Charger setting is 10 amps

100 x .50	**=**	**x**	**1.25**	**=**	**6.25 hours of charge needed**
10	**+**		**1.00**		**hour more if charging a deep cycle battery**
			7.25		**hours total for a deep cycle battery.**

A hydrometer reading of the specific gravity of the electrolyte (fluid) of the battery in good condition should be between 1.25 and 1.28.

When a battery reaches 80-85% of full charge, bubbles will appear on the surface of the fluid. As the battery nears full charge, bubbling will become more vigorous.

K. BATTERY CHARGING

1. Before charging any battery, make sure the electrolyte (battery liquid) in each cell is at correct level.
2. Set switch to the OFF position.
3. If the battery is being charged inside the vehicle, use connection procedures outlined in Section F. Should the battery be removed from the vehicle, follow the instruction in Section G. Now plug the charger into the AC outlet.
4. Set the charge rate switch to the desired charge position. See charge rate chart.

NOTE: These battery chargers are MANUAL type chargers and MUST have the charging monitored regularly. The battery can overcharge if the charging is not stopped when the battery is charged.

BATTERY SIZE/RATING			CHARGE RATE*/CHARGING TIME - HOURS**				
			2 AMP	10 AMP	30 AMP	40 AMP	60 AMP
SMALL BATTERIES	Motorcycle, Garden	6 - 12 AH	3-6	NR	NR	NR	NR
	Tractor, etc.	12 - 32 AH	3 - 18				
CAR/TRUCKS	200 - 315 CCA	40 - 60 RC	13 - 20	2 ½ - 4	½ - 1	½ - ¾	NR
	315 - 550 CCA	60 - 85 RC	20 - 35	4 - 7	1 - 2	¾ - 2	½ - 1
	550 - 875 CCA	85 - 125 RC	35 - 55	7 - 11	2 - 7	2 - 3	1 - 2
MARINE/ DEEP CYCLE		55 MC	34	7	NR	NR	NR
		80 MC	50	10	NR	NR	NR
		105 MC	66	13	NR	NR	NR

* Charge Rates for this model are listed on the front panel.
** Based on battery at 50% charge.

AH Ampere Hours
NR Not Recommended
CCA Cold Cranking Amps
RC Reserve Capacity
MC Marine Capacity