

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.**

GENERAL BATTERY SAFETY

- Before you use your battery charger, be sure to read all instructions and cautions printed on:
 - Battery Charger
 - Battery
 - Vehicle or unit using battery
- 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.
- Use only attachments recommended or sold by manufacturer. Use of non-recommended attachments may result in fire, electric shock, or injury.
- When disconnecting the battery charger, pull by the plug not by the cord. Pulling on the cord may cause damage to cord or plug.
- Locate battery power cord so it cannot be stepped on, tripped over, or subjected to damage or stress.
- Do not operate charger with damaged cord or plug. Have cord replaced 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 professional for inspection and repair.
- 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.
- To reduce risk of electric shock, unplug charger from outlet before attempting any maintenance or cleaning.
- 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:	18	18	18	16
- 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.
- Locate charger as far away from battery as DC charger cables permit.
- Do not expose charger to rain or snow.
- NEVER** charge a frozen battery. If battery fluid (electrolyte) is frozen, bring into a warm area to thaw before charging.
- NEVER** allow battery acid to drip on charger when reading specific gravity or filling battery.
- NEVER** set a battery on top of charger.
- NEVER** place charger directly above battery being charged. Gases from battery will corrode and damage charger.
- NEVER** touch the battery clips together when the charger is energized.
- NEVER** crank engine with charger attached to battery, and 120 volt line.

• **IMPORTANT SAFETY INSTRUCTIONS** •
• **SAVE THESE INSTRUCTIONS** •

SCHUMACHER ELECTRIC CORPORATION

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

Send Warranty Product Repairs to: 1025 E. Thompson, Hoopston, IL 60942-0280

Call Customer Service if you have questions: 1-800-621-5485

00-00-000457/0603

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!

GROUND AND AC POWER CORD CONNECTIONS

Charger should be grounded to reduce 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 FIGURE 1 (A). This plug should be used in a grounded outlet. The plug pins must fit the receptacle (outlet).

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

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

DANGER: NEVER alter the AC cord or plug provided. If it will not fit outlet, have proper outlet installed by a qualified electrician. Improper connection can result in a risk of an electric shock. **DANGER:** Before using an adaptor as illustrated, be certain that center screw of outlet plate is grounded. The green-colored rigid ear or lug extending from adaptor 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.

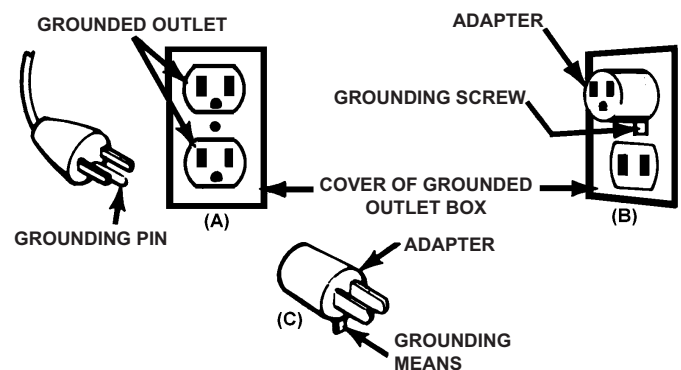


FIGURE 1 GROUNDING METHODS

PREPARING TO CHARGE

1. 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.
2. 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.
3. Clean battery terminals. Be careful to keep corrosion from coming in contact with eyes. Keep the battery terminals clean and tight. Use terminal protectors to prevent corrosion.
4. If battery has removable filler vents, check periodically to make sure battery electrolyte (liquid) covers the plates. If liquid is down, add water to bring level up. This also helps purge excessive gas from the cells.
5. Study all battery manufacturer's specific precautions such as removing or not removing cell caps while charging, and recommended rates of charge.
6. **DO NOT** use for parallel charging. Charger is designed to charge / maintain one 12 volt battery.

CHARGER LOCATION PRECAUTION

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

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

Do not operate charger in a closed-in area or restrict ventilation in any way.

Do not set battery on top of charger.

NOTE: DO NOT OVERFILL (OVERFILLING COULD RESULT IN DAMAGE).

MOUNTING INSTRUCTION

Figure 1 illustrates the charger mounting brackets.

Figure 2 illustrates surface mounting of the charger to the fender well. If using the nut and bolt provided, drill two holes between 3/16" and 1/4" in diameter. (For alignment of holes use one of the brackets as a template.) If the backside of the mounting surface is hard to reach, you may consider using two 1/2" sheet-metal screws instead of nut bolt, drill a pilot hole if required, drill holes between 1/8" and 5/32". **CAUTION:** Do not drill or puncture battery.

Electrical installations - Route and secure supply cord and output wiring away from gas line, carburetor or other hot, sharp or moving and pinch parts to avoid damage to the insulation. Secure the AC cord and plug to a cable or from using a self locking cable tie or equivalent.

Figure No. 3 illustrates mounting of the charger alongside the battery of your automobile. If convenient place the charger to the side of the battery away from the engine and fan blades, assemble the brackets as shown in figure No. 4. Loosen the battery retaining hardware enough that you can insert the longer portion of bracket "C" between the bottom of the battery and the battery mounting tray. Align the charger to freely stand without restrictions, then tighten all hardware.

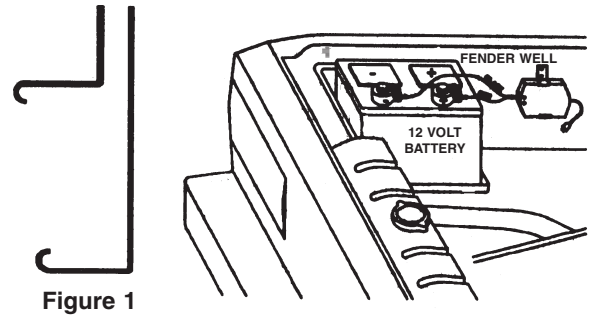


Figure 1

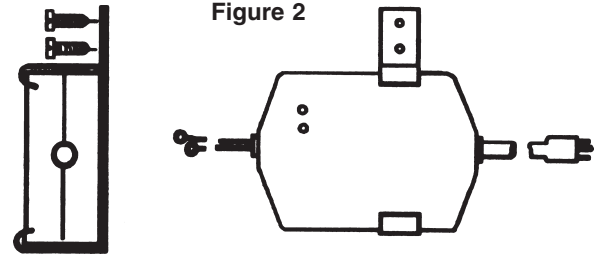


Figure 2

ELECTRICAL CONNECTION

The output leads of the charger are terminated with 3/8 inch ring lugs. Remove the bolts from the battery post connector, insert the bolt through the ring lug then place the bolt back in the battery connector and tighten. Connect the red lead to the positive (+) battery post and the black lead to the negative (-) post.

If you have difficulty connecting the output leads, consult your local auto supply store, they may assist you in finding a connecting device for your application.

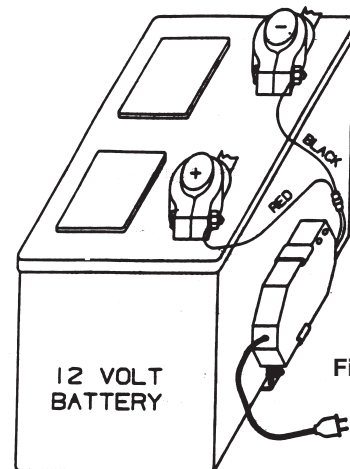


Figure 3

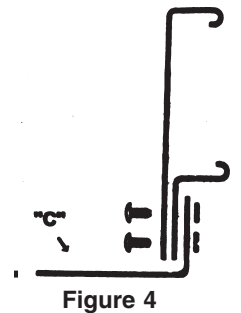


Figure 4



Figure 5

LIMITED WARRANTY

SCHUMACHER ELECTRIC CORPORATION, 801 BUSINESS CENTER DRIVE, MOUNT PROSPECT, ILLINOIS 60056-2179 MAKES THIS LIMITED WARRANTY TO THE ORIGINAL PURCHASER AT RETAIL OF THIS PRODUCT. THIS LIMITED WARRANTY IS NOT TRANSFERABLE.

Schumacher Electric Corporation warrants this battery charger for two years from date of purchase at retail against defective material or workmanship. If such should occur, the unit will be repaired or replaced at the option of the manufacturer. It is the obligation of the purchaser to forward the unit together with proof of purchase, transportation and/or mailing charges prepaid to the manufacturer or its authorized representative.

This limited warranty is void if the product is misused, subjected to careless handling, or repaired by anyone other than the manufacturer or its authorized representative.

The manufacturer makes no warranty other than this limited warranty and expressly excludes any implied warranty including any warranty for consequential damages.

THIS IS THE ONLY EXPRESS LIMITED WARRANTY AND THE MANUFACTURER NEITHER ASSUMES NOR AUTHORIZES ANYONE TO ASSUME OR MAKE ANY OTHER OBLIGATION TOWARDS THE PRODUCT OTHER THAN THIS EXPRESS LIMITED WARRANTY. THE MANUFACTURER MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE OF THIS PRODUCT AND EXPRESSLY EXCLUDES SUCH FROM THIS LIMITED WARRANTY.

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LENGTH OF IMPLIED WARRANTY SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

OPERATING INSTRUCTIONS

Model SE-1-12S is intended for use with 12 volt battery systems only. The charger contains an electronic control circuit which safeguards against overcharging the battery.

After reading and following the directions "Charging battery in vehicle" or "Charging battery out of vehicle," you may observe the following conditions:

Light Color	On/Off	Condition
Green	Off	Check wall receptacle for 120 volts or check lead connections, may be reversed.
Green	On	AC Power is present.
Red	On	Battery charger voltage is approximately 14 volts and charging has stopped.
Red	Off	Battery voltage has dropped one volt and the charging has resumed.

The on/off cycle of the red light will continue, the red light will stay on for longer periods of time as the battery becomes more fully charged. Your charger has been designed NOT to spark if the ring lugs on the leads accidentally touch one another, or if the leads are connected in reverse.

The battery must measure at least 2 volts to start the charging of the battery. The green light will be on even if the charging is not taking place. You can verify charging by measuring the battery voltage and noting an increase in volts.

This charger is ideally suited for maintaining the battery charge level for the following applications.

1. Storage of a battery during non-seasonal use.
2. For vehicles seldom used or placed in storage.
3. For improved battery performance during cold weather.

Smaller batteries such as those used on motorcycles and garden tractors can be charged overnight.

For large automotive or marine battery which are deeply discharged, it is recommended to recharge first with a larger charger (such as a 10 amp) then use the SE-1-12S to maintain the charge level of the battery.

If the battery is used in automobile or other application which has its own means of charging a battery, the above time maybe greatly reduced by partially charging the battery before applying the charger.

CHARGING BATTERY IN VEHICLE

FOLLOW THESE STEPS WHEN BATTERY IS INSTALLED IN VEHICLE A SPARK NEAR BATTERY MAY CAUSE BATTERY EXPLOSION. TO REDUCE RISK OF SPARK NEAR BATTERY:

1. Position AC and DC cords to reduce risk of damage by hood, door or moving parts.
2. Stay clear of fan blades, belts, pulleys and other parts that can cause injury.
3. Check polarity of battery posts. POSITIVE (+) battery post usually has a larger diameter than the NEGATIVE (-) post.
4. Determine which post of battery is grounded (connected to the chassis). If negative post is grounded to chassis, as in

most vehicles, see item 5. If positive post is grounded to chassis, see item 6.

5. For common negative grounded vehicle, connect positive (red) terminal from battery charger to positive (+) ungrounded post of the battery. Connect negative (-) ring terminal to the vehicle chassis or engine block away from battery as far as the leads will permit. Do not connect ring terminal to the carburetor, fuel lines, or sheet metal body parts. Connect to a heavy gauge metal part of the frame or engine block or the negative post.
6. For positive grounded vehicle, connect negative (blk) ring terminal from the battery charger to the NEG (-) ungrounded battery post. Connect POS (+) red ring terminal to the vehicle chassis or engine block or the POS battery post. DO NOT connect the ring terminal to the carburetor, fuel lines, or sheet metal body parts. Connect to a heavy gauge metal part of the frame or engine block.
7. Only after completing steps 1 through 6, plug the extension cord into grounded 120 volt 60 hertz outlet.

PROPER DISCONNECT PROCEDURE

1. Always unplug extension cord before doing anything else.
2. Disconnect the grounded clamp from the engine block, framework or battery.
3. Finally disconnect the remaining clamp from battery terminal post.

NOTE: When connected to an electrical source, the charger may hum or buzz. This is normal. Also, the charger is designed to get quite warm. Do not set on flammable material.

CHARGING BATTERY OUT OF VEHICLE

For some applications you may need to purchase a terminal similar to that shown in figure 5 to make connections.



Figure 5

Check polarity of battery posts. POS (+) usually is the larger diameter than NEG (-) post. Connect POS (+) red lead ring terminal to positive post of the battery. Position yourself away from the battery as far as possible, then connect NEG (-) blk lead ring terminal to the negative (-) post of the battery. DO NOT face battery when making final connection.

A marine (boat) battery must be removed and charged on shore. To charge it on board requires equipment specially designed for marine use.

CHARGER OVERLOAD PROTECTION

Your battery charger is protected from power overload by an automatic heat sensing switch. The protector will open with a clicking sound and reclose after a brief cooling period.

MAINTENANCE AND CLEANING

Very little maintenance is required. As with any appliance or tool, a few common sense rules will prolong the life of your battery charger.

Store in a clean, dry place.

Clean case and cords with a dry or slightly damp cloth.

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