OWNERS MANUAL

Models:
SE-2352, SE-3000, SE-3612, SE-4020, SE-4022, SE-6030, SE-8050
Manual Battery Charger

SE-4020

PLEASE SAVE THIS OWNERS MANUAL AND READ BEFORE EACH USE. This manual will explain how to use the battery charger safely and effectively. Please read and follow these instructions and precautions carefully.

CONTENTS

1. IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS.

1.1 SAVE THESE INSTRUCTIONS – This manual contains important safety and operating instructions.

1.2 Do not expose the charger to rain or snow.

1.3 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.

1.4 To reduce the risk of damage to electric plug and cord, pull by the plug rather than the cord when disconnecting charger.

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

- That the pins on plug of extension cord are the same number, size and shape as those of plug on charger.
- That extension cord is properly wired and in good electrical condition; and
- That wire size is large enough for AC ampere rating of charger as specified in the section 8.

1.6 Do not operate charger with damaged cord or plug – replace the cord or plug immediately.

1.7 Do not operate charger if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified serviceman.

1.8 Do not disassemble charger; take it to a qualified serviceman when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.

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

1.10 WARNING: RISK OF EXPLOSIVE GASES.

a. 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 YOU FOLLOW THE INSTRUCTIONS EACH TIME YOU USE THE CHARGER.

b. 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 vicinity of battery. Review cautionary marking on these products and on engine.

1.11 Pursuant to California Proposition 65, this product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.

2. PERSONAL SAFETY PRECAUTIONS

2.1 Consider having someone close enough by to come to your aid when you work near a lead-acid battery.

2.2 Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.

2.3 Wear complete eye protection and clothing protection. Avoid touching eyes while working near battery.

2.4 If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flood eye with running cold water for at least 10 minutes and get medical attention immediately.

2.5 NEVER smoke or allow a spark or flame in vicinity of battery or engine.

2.6 Be extra cautious, to reduce risk of dropping a metal tool onto battery. It might spark or short-circuit battery or other electrical part that may cause explosion.

2.7 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.

2.8 Use charger for charging only LEAD-ACID-type rechargeable batteries. 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.

2.9 NEVER charge a frozen battery.

3. PREPARING TO CHARGE

3.1 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.

3.2 Be sure area around battery is well ventilated while battery is being charged.

3.3 Clean battery terminals. Be careful to keep corrosion from coming in contact with eyes.

3.4 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.

3.5 Study all battery manufacturer's specific precautions while charging and recommended rates of charge.

3.6 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.

4. CHARGER LOCATION

4.1 Locate charger as far away from battery as DC cables permit.

4.2 Never place charger directly above battery being charged; gases from battery will corrode and damage charger.

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

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

4.5 Do not set a battery on top of charger.

5. DC CONNECTION PRECAUTIONS

5.1 Connect and disconnect DC output clips only after setting any charger switches to "off" position and removing AC cord from electric outlet. Never allow clips to touch each other.

5.2 Attach clips to battery and chassis, as indicated in the sections 6 and 7.

6. FOLLOW THESE STEPS WHEN BATTERY IS INSTALLED IN VEHICLE

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

6.1 Position AC and DC cords to reduce risk of damage by hood, door, or moving engine part.

6.2 Stay clear of fan blades, belts, pulleys, and other parts that can cause injury to persons.

6.3 Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has larger diameter than NEGATIVE (NEG, N,–) post.

6.4 Determine which post of battery is grounded (connected) to the chassis. If negative post is grounded to chassis (as in most vehicles), see (6.5). If positive post is grounded to the chassis, see (6.6).

6.5 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 gage metal part of the frame or engine block.

6.6 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 gage metal part of the frame or engine block.

6.7 When disconnecting charger, turn switches to off, disconnect AC cord, remove clip from vehicle chassis, and then remove clip from battery terminal.

6.8 See *Operating Instructions* for length of charge information.

7. FOLLOW THESE STEPS WHEN BATTERY IS OUTSIDE VEHICLE

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

7.1 Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has a larger diameter than NEGATIVE (NEG, N, –) post.

7.2 Attach at least a 24-inch-long 6-gauge (AWG) insulated battery cable to NEGATIVE (NEG, N, –) battery post.

7.3 Connect POSITIVE (RED) charger clip to POSITIVE (POS, P, +) post of battery.

7.4 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.

7.5 Do not face battery when making final connection.

7.6 When disconnecting charger, always do so in reverse sequence of connecting procedure and break first connection while as far away from battery as practical.

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

8. GROUNDING AND AC POWER CORD CONNECTIONS

This battery charger is for use on a nominal 120 volt 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.

DANGER: Never alter the AC cord or plug provided – if it does not fit the outlet, have a proper grounded outlet installed by a qualified electrician. An improper connection can result in a risk of an electric shock or electrocution.

NOTE: Pursuant to Canadian Regulations, use of an adapter plug is not allowed in Canada. Use of an adapter plug in the United States is not recommended and should not be used.

USING AN EXTENSION CORD

The use of an extension cord is not recommended. If you must use an extension cord, follow these guidelines:

- Pins on plug of extension cord must be the same number, size, and shape as those of plug on charger.
- Ensure that the extension cord is properly wired and in good electrical condition.
- Wire size must be large enough for the AC ampere rating of charger, as specified:

Length of cord (feet)	25	50	100	150
AWG* size of cord	16	12	10	8

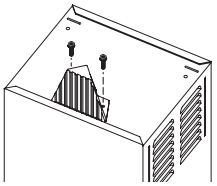
*AWG-American Wire Gauge

9. ASSEMBLY INSTRUCTIONS

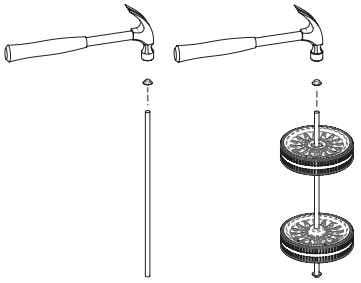
9.1 It is important to fully assemble your charger before use. Remove all cord wraps and uncoil the cables prior to using the battery charger. Follow these instructions for assembly.

PARTS	TOOLS NEEDED
(2) 10-32, thread cutting screws	3/8" wrench (for mounting foot)
(2) 10-24 x 5/8” thread cutting screws	5/16" wrench (for mounting wheels)
(2) wheels	1/4" wrench (for mounting handle)
(1) axle	hammer
(2) axle caps	flat-head screwdriver (not included)
(2) axle brackets	Phillips-head screwdriver (not included)
(1) handle	
(1) foot	

9.2 Attach the foot: Remove the charger from the packing materials and place upside down on a flat surface. Attach the foot and secure it with the two 10-24 x 5/8" thread cutting screws provided.

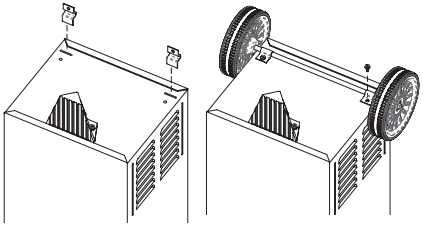


9.3 Assemble the wheels and axle: Hold the axle upright on the floor or work surface. Then, using a hammer, tap one of the axle caps onto the top end of the axle. Be sure to tap the axle cap on straight. Slide both wheels onto the axle with the recessed hubs facing out as shown. Install the second axle cap.

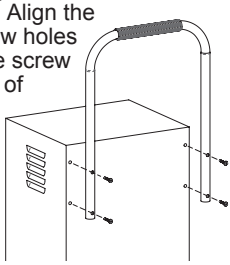


9.4 Mount the axle to the charger: Place one end of each bracket into the slot on the bottom of the charger. Place the axle assembly under each bracket. Attach the brackets using the two 10-32 thread cutting screws provided.

NOTE: Be careful not to drop the brackets inside of the charger case.



9.5 Attach the handle: Turn the charger right side up onto its foot and wheels. Remove the two top screws from each side of the charger. Align the handle, so the screw holes are aligned with the screw holes on each side of the charger. Attach the handle, using the same screws you previously removed.



10. CONTROL PANEL

CHARGE RATE SELECTOR SWITCH

Use the charge rate selector switch to select the charge rate or engine start setting.

- **1.5A, 2A or 4A Slow Charge –** For small batteries, such as those commonly used in garden tractors, snowmobiles and motorcycles.
- **10A, 15A, 30A, 35A, 40A, 60A or 80A Fast Charge –** For charging automotive, marine and deep-cycle batteries. Not intended for industrial applications.
- **100A, 150A, 200A or 300A Engine Start –** Provides additional amps for cranking an engine with a weak or run-down battery. Always use in combination with a battery.

TIMER (Not applicable for SE-2352)

The timer allows you to set a specified time for charging. After the timer expires, the charger stops charging your battery. The main function of the timer is to prevent overcharging, while allowing a battery time to obtain a satisfactory charge. To properly set the timer, you must know the size of the battery (in ampere hours) or reserve capacity (in minutes) and the state of charge.

It is important that you determine the appropriate state of charge of your battery and set the timer accordingly.

Hold – This position defeats the timer function, allowing for continuous operation. Be sure to monitor the charging progress and stop when the battery is charged. The hold position will overcharge a battery if it is not monitored. This will damage your battery and may cause property damage or personal injury.

AMMETER

The Ammeter 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 being drawn by the battery. When the current stops decreasing, the battery is charged. The start area of the meter indicates a high rate of current being drawn from the charger. When cranking an engine, the meter needle will be at the extreme right side of the start area. The 2 amp charge rate may indicate some activity on the meter, although the meter does not have the resolution to display this low rate.

PERCENT OF CHARGE

The percent of charge scale is intended as a visual aid to help simplify reading the state of charge. The percent of charge is based on the current drawn by the battery. For this reason, accuracy will vary with the size and battery type. This means that the indication for a fully charged large battery may be slightly less than 100%.

TOGGLE SWITCHES (SE-2352 and SE-3612 only)

Model SE-2352 employs 2 toggle switches:

- **Switch #1 –** Use this switch to select the 200 Amp Engine Start and the 35 Amp Charge Rate. Switch #2 must be in the down position (Select Position) when using Switch #1.
- **Switch #2 –** Use this switch to select the 2 amp Charge Rate and the OFF position. Also use to select use of Switch #1. Note that Switch #1 is only effective when Switch #2 is set to "Select Position."

Model SE-3612 employs 3 toggle switches:

- **Switch #1 (Furthest left) –** Use this switch to select the 12 volt 200 amp engine start (down) or the 12 volt 40 amp charge (up) position. The center switch (#2) must be in the (up) position when switch #1 is used.
- **Switch #2 (Center) –** Use this switch to select use of either switch #1 or switch #3. Down for switch #3 and up for switch #1.
- **Switch #3 (Right) –** Use this switch to select the 12 volt 2 amp charge (up) or the 6 volt 100 amp engine start (down). The center switch (#2) must be in the down position to use switch #3.

BATTERY LOAD TESTER SWITCH (SE-8050 only)

When testing a battery, use this switch to apply a load to it.

BATTERY TESTER SWITCH (SE-4022 only)

Use this switch to select either the 6 volt or 12 volt battery tester setting.

VOLTAGE SELECTOR SWITCH

Use to set the scale of the voltmeter to either 6V or 12V DC, to match the battery or batteries being charged.

NOTE: This does not change the output voltage of the charger.

VOLTMETER

The voltmeter indicates the voltage at the battery clamps. The charger need not be plugged into an AC outlet. The timer should be in the OFF position. Then connect the charger, following the instructions provided.

11. OPERATING INSTRUCTIONS

WARNING: A spark near battery may cause an explosion.

CHARGING A BATTERY IN THE VEHICLE

1. Turn off all the vehicle's accessories.
2. Keep the hood open.
3. Clean the battery terminals.
4. Set the charge rate switch and the timer to the OFF position.
5. Lay the AC/DC cables away from any fan blades, belts, pulleys and other moving parts that can cause injury.
6. Connect the battery, following the precautions listed in sections 6 and 7.
7. Connect the charger to an electrical outlet.
8. Select the desired charge rate.

   For models SE-2352 and SE-3612, place the toggle switches (switch #1, #2 or #3) in the appropriate position.
9. Set the timer to the charge time (does not apply to SE-2352); MONITOR THE CHARGER AND THE BATTERY.
10. When disconnecting the charger, set the charge rate switch and the timer to the OFF position, disconnect the charger from the AC power, remove the clamp from the vehicle chassis, and then remove the clamp from the battery terminal.

CHARGING A BATTERY OUTSIDE OF THE VEHICLE

1. Place battery in a well-ventilated area.
2. Set the charge rate switch and the timer to the OFF position.
3. Clean the battery terminals.
4. Connect the battery, following the precautions listed in sections 6 and 7.
5. Connect the charger to the electrical outlet.
6. Select the desired charge rate.

   For models SE-2352 and SE-3612, place the toggle switches (switch #1, #2 or #3) in the appropriate position.
7. Set the timer to the charge time (does not apply to SE-2352); MONITOR THE CHARGER AND THE BATTERY.

8. When disconnecting the charger, set the charge rate switch and the timer to the OFF position, disconnect the charger from the AC power, disconnect the negative clamp, and finally the positive clamp.
9. A marine (boat) battery must be removed and charged on shore.

MANUAL CHARGING MODE

When manual mode is performed, the charger will continue to charge and will not shut off. Monitor the charging process and stop when the battery is fully charged. Not doing so may damage your battery and result in property damage or personal injury.

USING THE ENGINE START FEATURE

Your battery charger can be used to jump start your car if the battery is low. Follow all safety instructions and precautions for charging your battery. Wear complete eye protection and protective clothing.

WARNING: 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. Have the battery checked.

1. Set the charge rate switch and the timer to the OFF position.
2. With the charger unplugged from the AC outlet, connect the charger to the battery following the instructions given in the CHARGING A BATTERY IN THE VEHICLE section.
3. Plug the charger's AC power cord into the AC outlet, and then move the timer switch from OFF to the HOLD position (does not apply to SE-2352).
4. With the charger plugged in and connected to the battery of the vehicle, set the charge rate selector switch to the engine start position.

   For models SE-2352 and SE-3612, place the toggle switches (switch #1, #2 or #3) in the appropriate position.
5. Crank the engine until it starts or 5 seconds pass. If the engine does not start, wait 3 minutes before cranking again. This allows the charger and battery to cool down.

NOTE: During extremely cold weather, or if the battery is under 2 volts, charge the battery for 5 minutes before cranking the engine.

6. If the engine fails to start, charge the battery for 5 more minutes before attempting to crank the engine again.
7. After the engine starts, move the charge rate selector switch and timer to the OFF position and unplug the AC power cord before disconnecting the battery clamps from the vehicle.
8. Clean and store the charger in a dry location.

NOTE: If the engine does turn over but never starts, there is not a problem with the starting system; there is a problem somewhere else with the vehicle. STOP cranking the engine until the other problem has been diagnosed and corrected.

USING THE BATTERY VOLTAGE TESTER (SE-4022 only)

1. Set the Voltage Selector switch to the correct setting (6V or 12V) for your battery.
2. Set the timer to the OFF position.
3. Connect the battery to the charger, as specified earlier. The charger does not need to be plugged into an AC outlet.
4. Read the voltmeter.

Keep in mind that this reading is only a battery voltage reading; a false charge may mislead you. We suggest that you turn on the headlights for a couple of minutes and then wait a couple of minutes after you have turned them off before reading the meter. Then, follow the convenient color code shown on the meter.

USING THE BATTERY LOAD TESTER (SE-8050 only)

1. Set the Voltage Selector switch to the correct setting (6V or 12V) for your battery.
2. Set the timer to the OFF position.
3. Connect the battery to the charger as specified earlier. The charger does not need to be plugged into an AC outlet.
4. Press the Battery Load Test switch to LOAD ON for 10 seconds and read the voltmeter.

- **Green –** Indicates the battery capacity is OK. The battery may or may not be fully charged. Check the specific gravity to determine the state of charge. If the specific gravity shows less than a full charge, check for an electrical drain on the battery or for possible charging system problems. Recharge the battery to full charge.

- **Yellow or Red, but the needle remains steady –** Indicates that the battery capacity is not satisfactory. The battery may be either defective or not fully charged. Check the specific gravity of the battery to see which condition exists. If charging does not bring the battery up to a full charge, the battery should be replaced.
- **Yellow or Red, but the needle continues to fall –** Indicates the battery may be defective or run-down. Release the load switch and note the voltmeter reaction. Voltage recovery into the green or above within seconds indicates a defective battery. A slow recovery indicates a run-down condition. For best results, check the specific gravity of the battery.

FAN OPERATION

It is normal for the fan to be on all the time. Keep the area near the charger clear of obstructions to allow the fan to operate efficiently.

12. CALCULATING CHARGE TIME

When you know the percent of charge and the Amp hour (Ah) rating of your battery, you can calculate the approximate time needed to bring your battery to a full charge.

Example:

$$\text{Amp hour rating} = \frac{\text{Reserve capacity}}{2} + 16$$

NOTE: The Reserve Capacity can be obtained from the battery's specification sheet or the owners manual.

To calculate the time needed for a charge:

1. Find the percentage of charge needed.
2. Multiply the Amp hour rating by the charge needed, and divide by the charge rate.
3. Multiply the results by 1.25 to find the total time needed, in hours, to bring the battery to full charge.
4. Add an additional hour for a deep-cycle battery.

Example:

$$\frac{\text{Ah rating} \times \%\text{ of charge needed}}{\text{Charger Amp setting}} \times 1.25 = \text{hrs of charge}$$

$$\frac{100\ (\text{Ah rating}) \times .50\ (\text{charge needed})}{20\ (\text{Charger Setting})} \times 1.25 = 3.125\ \text{hrs}$$

$$\frac{100 \times .50}{20} \times 1.25 = 3.125$$

You need to charge a 100 Ampere hour battery for a little more than 3 hrs at the 20 Amp charge rate, using this example.

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

Ah – Ampere Hours

NR – the charger setting is NOT RECOMMENDED.

CCA – Cold Cranking Amps

RC – Reserve Capacity

The times given are for batteries with a 50% charge prior to recharging.

BATTERY SIZE/RATING			CHARGE RATE/CHARGING TIME									
			1.5 A	2A	4A	10A	15A	30A	35A	40A	60A	80A
SMALL BATTERIES	Motorcycle, garden tractor, etc.	6-12 Ah	2¼-5 h	2-3¾ h	1-2 h	NR	NR	NR	NR	NR	NR	NR
		12-32 Ah	5-13¼ h	3¾-10 h	2-5 h	NR	NR	NR	NR	NR	NR	NR
CARS/ TRUCKS	200-315 CCA	40-60 RC	15-19¼ h	11¼-14½ h	5¾-7¼ h	2¼-3 h	1½-2 h	¾-1 h	40-50 min	½-¾ h	23-29 min	17-22 min
	315-550 CCA	60-85 RC	19¼-24½ h	14½-18¼ h	7¼-9 h	3-3¾ h	2-2½ h	1-1¼ h	50-60 min	¾-1 h	29-37 min	22-28 min
	550-1000 CCA	85-190 RC	24½-46¼ h	18¼-34¾ h	9-17½ h	3¾-7 h	2½-4½ h	1¼-2¼ h	1-2 h	1-1¾ h	37-70 min	28-52 min
MARINE/DEEP CYCLE		80 RC	23½ h	17½ h	8¾ h	3½ h	2¼ h	NR	NR	NR	NR	NR
		140 RC	36 h	27 h	13½ h	5½ h	3½ h	NR	NR	NR	NR	NR
		160 RC	40 h	30 h	15 h	6 h	4 h	NR	NR	NR	NR	NR
		180 RC	44 h	33 h	16½ h	6½ h	4½ h	NR	NR	NR	NR	NR

13. MAINTENANCE AND CARE

A minimal amount of care can keep your battery charger working properly for years.

- Clean the clamps each time you are finished charging. Wipe off any battery fluid that may have come in contact with the clamps to prevent corrosion.
- Occasionally cleaning the case of the charger with a soft cloth will keep the finish shiny and help prevent corrosion.
- Coil the input and output cords neatly when storing the charger. This will help prevent accidental damage to the cords and charger.
- Store the charger unplugged from the AC power outlet in an upright position.
- Store inside, in a cool, dry place. Do not store the clamps on the handle, clipped together, on or around metal, or clipped to the cables.

14. TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	REASON/SOLUTION
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.
No reading on the ammeter.	Charger is not plugged in.	Plug the charger into an AC outlet.
	No power at the receptacle.	Check for open fuse or circuit breaker supplying AC outlet.
	Clamps are not making a good connection to the battery.	Check for poor connection to battery and frame. Make sure connection points are clean. Rock clamps back and forth for a better connection.
	Connections are reversed.	Unplug the charger and reverse the clamps.
	Battery is defective (will not accept a charge).	Have the battery checked.
	2 amp charge rate is being used.	Ammeter may show no activity at the 2A charge rate.
Ammeter reading stays high.	Battery is severely discharged.	Continue charging battery for two more hours. If problem continues, have the battery checked.
	Wrong battery voltage.	Verify you are trying to charge a 12 Volt battery.
Ammeter reads less than selected charge rate when charging a discharged battery.	Extension cord is too long or wire gauge is too small.	Use a shorter or heavier gauge extension cord.
	Weak cell or sulfated plate in battery.	A sulfated battery will eventually take a normal charge if left connected. If the battery will not take a charge, have it checked.
	Battery is only partially discharged.	Continue to charge the battery.

PROBLEM	POSSIBLE CAUSE	REASON/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 clamps.	Circuit breaker cycles when current draw is too high. Check for shorted cables or clamps 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.
	Reversed 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.
Short or no start cycle when cranking engine.	Drawing more than the engine start rate.	Crank time varies with the amount of current drawn. If cranking draws more than the engine start rate, crank time may be less than 3 seconds.
	Failure to wait 3 minutes (180 seconds) between cranks.	Wait 3 minutes of rest time before the next crank.
	Clamps are not making a good connection.	Check for poor connection at battery and frame.
	AC cord and/or extension cord is loose.	Check power cord and extension cord for loose fitting plug.
	No power at receptacle.	Check for open fuse or circuit breaker supplying AC outlet.
	The charger may be overheated.	The thermal protector may have tripped and needs a little longer to reset. Make sure the charger vents are not blocked. Wait and try again.
	Battery may be severely discharged.	On a severely discharged battery, charge for 10 to 15 minutes at the lowest rate, to help assist in cranking.
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.