

OPERATOR'S MANUAL

DieHard®

12V Manual Battery Charger & Engine Starter



Model No.
28.71230

CAUTION

Read and follow all Safety
Rules and Operating Instructions
before Every Use of this Product.

SAVE THESE INSTRUCTIONS.

Sears Brands Management Corporation, Hoffman Estates, IL 60179 U.S.A.

00-99-001012/0510

TABLE OF CONTENTS

SECTION	PAGE
IMPORTANT SAFETY INSTRUCTIONS	2
PERSONAL PRECAUTIONS	3
PREPARING TO CHARGE	3
CHARGER LOCATION	4
DC CONNECTION PRECAUTIONS	4
FOLLOW THESE STEPS WHEN BATTERY IS INSTALLED IN VEHICLE	5
FOLLOW THESE STEPS WHEN BATTERY IS OUTSIDE VEHICLE	6
GROUNDING AND AC POWER CORD CONNECTIONS	7
ASSEMBLY INSTRUCTIONS	7
FEATURES/CONTROL PANEL	10
OPERATING INSTRUCTIONS	11
CALCULATING CHARGE TIME	12
MAINTENANCE INSTRUCTIONS	12
MOVING AND STORAGE INSTRUCTIONS	13
TROUBLESHOOTING	13
BEFORE RETURNING FOR REPAIRS	15

DIEHARD THREE-YEAR FULL WARRANTY

When operated and maintained according to all supplied instructions, if this DieHard product fails due to a defect in material or workmanship within 3 years from the date of purchase, return it to any DieHard outlet in the United States for free replacement.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Sears Brands Management Corporation, Hoffman Estates, IL 60179

**FOR CUSTOMER ASSISTANCE OR REPLACEMENT PARTS,
CALL TOLL-FREE FROM 7 AM TO 5 PM CT
MONDAY THROUGH FRIDAY: 1-800-732-7764**

IMPORTANT: READ AND SAVE THIS SAFETY AND INSTRUCTION MANUAL.

SAVE THESE INSTRUCTIONS – The 71230 offers a wide range of features to accommodate your needs. This manual will show you how to use your charger safely and effectively. Please read, understand and follow these instructions and precautions carefully, as this manual contains important safety and operating instructions. The safety messages used throughout this manual contain a signal word, a message and an icon.

The signal word indicates the level of the hazard in a situation.

▲ DANGER Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury to the operator or bystanders.

▲ WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to the operator or bystanders.

▲ CAUTION Indicates a potentially hazardous situation which, if not avoided, could result in moderate or minor injury to the operator or bystanders.

IMPORTANT Indicates a potentially hazardous situation which, if not avoided, could result in damage to the equipment or vehicle or property damage.

Safety messages in this manual contain two different sentence styles.

- Unnumbered sentences state the hazard.
- Numbered sentences state how to avoid the hazard.

The icon gives a graphical description of the potential hazard.

▲ WARNING



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.

1. IMPORTANT SAFETY INSTRUCTIONS - SAVE THESE INSTRUCTIONS -

This manual contains important safety and operating instructions



RISK OF ELECTRIC SHOCK OR FIRE.

- 1.1 Keep out of reach of children.
- 1.2 Do not expose the charger to rain or snow.
- 1.3 Use only recommended attachments. 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.
- 1.4 To reduce the risk of damage to the electric plug or cord, pull by the plug rather than the cord when disconnecting the charger.
- 1.5 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 the pins on the plug of the extension cord are the same number, size and shape as those of the plug on the charger.
 - That the extension cord is properly wired and in good electrical condition.
 - That the wire size is large enough for the AC ampere rating of the charger as specified in section 8.
- 1.6 **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.**
- 1.7 Do not operate the charger with a damaged cord or plug; have the cord or plug replaced immediately by a qualified service person. (Call customer service at: 1-800-732-7764.)
- 1.8 Do not operate the charger if it has received a sharp blow, been dropped or otherwise damaged in any way; take it to a qualified service person. (Call customer service at: 1-800-732-7764.)
- 1.9 Do not disassemble the charger; take it to a qualified service person when service or repair is required. Incorrect reassembly may result in a risk of fire or electric shock. (Call customer service at: 1-800-732-7764.)



RISK OF EXPLOSIVE GASES.

- 1.10 **WORKING IN THE VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. FOR THIS REASON, IT IS OF UTMOST IMPORTANCE THAT YOU FOLLOW ALL INSTRUCTIONS IN THIS MANUAL EACH TIME YOU USE THE CHARGER.**
- 1.11 To reduce the risk of a battery explosion, follow all instructions in this manual 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.

2. PERSONAL PRECAUTIONS

▲WARNING



RISK OF EXPLOSIVE GASES.

- 2.1 NEVER smoke or allow a spark or flame in the vicinity of a battery or engine.
- 2.2 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.
- 2.3 Be extra cautious to reduce the risk of dropping a metal tool onto the battery. It might spark or short-circuit the battery or other electrical part that may cause an explosion.
- 2.4 Use this charger for charging LEAD-ACID batteries only. It is not intended to supply power to a low voltage electrical system other than in a starter-motor application. 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.
- 2.5 NEVER charge a frozen battery.
- 2.6 NEVER overcharge a battery.
- 2.7 Consider having someone close enough by to come to your aid when you work near a lead-acid battery.
- 2.8 Have plenty of fresh water and soap nearby in case battery acid contacts your skin, clothing or eyes.
- 2.9 Wear complete eye and body protection, including safety goggles and protective clothing. Avoid touching your eyes while working near the battery.
- 2.10 If battery acid contacts 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 get medical attention right away.
- 2.11 If battery acid is accidentally swallowed, drink milk, the whites of eggs or water. DO NOT induce vomiting. Seek medical attention immediately.

3. PREPARING TO CHARGE

▲WARNING



▲WARNING



RISK OF CONTACT WITH BATTERY ACID. BATTERY ACID IS A HIGHLY CORROSIVE SULFURIC ACID.

- 3.1 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.
- 3.2 Be sure the area around the battery is well ventilated while the battery is being charged.
- 3.3 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.

- 3.4 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.
- 3.5 Read, understand and follow all instructions for the charger, battery, vehicle and any equipment used near the battery and charger. Study all of the battery manufacturer's specific precautions while charging and recommended rates of charge.
- 3.6 Determine the voltage of the battery by referring to the vehicle owner's manual and make sure that the output voltage selector switch is set to the correct voltage. If the charger has an adjustable charge rate, charge the battery in the lowest rate first.
- 3.7 Make sure that the charger cable clips make tight connections.

4. CHARGER LOCATION



RISK OF EXPLOSION AND CONTACT WITH BATTERY ACID.

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

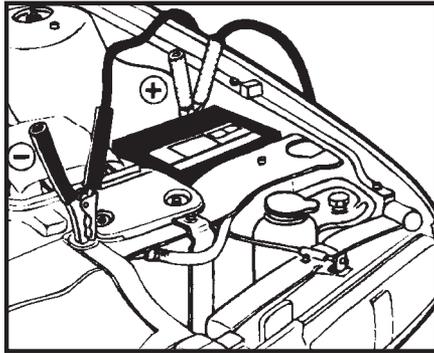
5. DC CONNECTION PRECAUTIONS

- 5.1 Connect and disconnect the DC output clips only after setting all of the charger switches to the "off" position (if applicable) and removing the AC plug from the electrical outlet. Never allow the clips to touch each other.
- 5.2 Attach the clips to the battery and chassis, as indicated in 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:



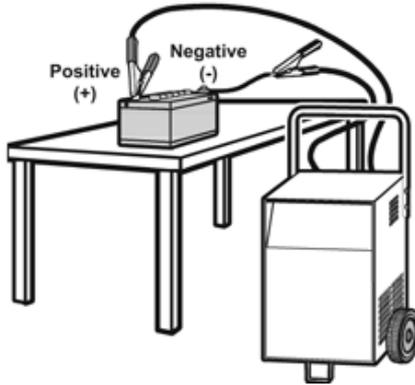
NEGATIVE GROUNDED SYSTEM

- 6.1** Position the AC and DC cables to reduce the risk of damage by the hood, door and moving or hot engine parts. 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.
- 6.2** Stay clear of fan blades, belts, pulleys and other parts that can cause injury.
- 6.3** Check the polarity of the battery posts. The POSITIVE (POS, P, +) battery post usually has a larger diameter than the NEGATIVE (NEG, N, -) post.
- 6.4** Determine which post of the battery is grounded (connected) to the chassis (vehicle frame). If the negative post is grounded to the chassis (as in most vehicles), see step 6.5. If the positive post is grounded to the chassis, see step 6.6.
- 6.5** For a negative-grounded vehicle, connect the POSITIVE (RED) clip from the battery charger to the POSITIVE (POS, P, +) ungrounded post of the battery. Connect the NEGATIVE (BLACK) clip to the vehicle frame or engine block at a distance away from the battery. Do not connect the clip to the carburetor, fuel lines or sheet-metal body parts. Connect to a heavy gauge metal part of the vehicle frame or engine block.
- 6.6** For a positive-grounded vehicle, connect the NEGATIVE (BLACK) clip from the battery charger to the NEGATIVE (NEG, N, -) ungrounded post of the battery. Connect the POSITIVE (RED) clip to the vehicle frame or engine block at a distance away from the battery. Do not connect the clip to the carburetor, fuel lines or sheet-metal body parts. Connect to a heavy gauge metal part of the vehicle frame or engine block.
- 6.7** Connect charger AC supply cord to electrical outlet.
- 6.8** When disconnecting the charger, turn all switches to off, disconnect the AC cord, remove the clip from the vehicle chassis and then remove the clip from the battery terminal.
- 6.9** See CALCULATING CHARGE TIME 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:



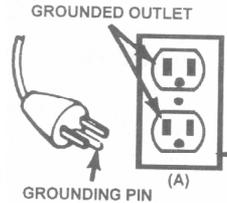
- 7.1 Check the polarity of the battery posts. The POSITIVE (POS, P, +) battery post usually has a larger diameter than the NEGATIVE (NEG, N, -) post.
- 7.2 Attach at least a 24-inch (61 cm) long 6-gauge (AWG) insulated battery cable to the NEGATIVE (NEG, N, -) battery post.
- 7.3 Connect the POSITIVE (RED) charger clip to the POSITIVE (POS, P, +) post of the battery.
- 7.4 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 to the free end of the cable.
- 7.5 Do not face the battery when making the final connection.
- 7.6 Connect charger AC supply cord to electrical outlet.
- 7.7 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.
- 7.8 A marine (boat) battery must be removed and charged on shore. To charge it onboard requires equipment specially designed for marine use.

8. GROUNDING AND AC POWER CORD CONNECTIONS



RISK OF ELECTRIC SHOCK OR FIRE.

- 8.1 This battery charger is for use on a nominal 120-volt circuit and has a grounded plug that looks like the plug illustrated. 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.



- 8.2 **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.

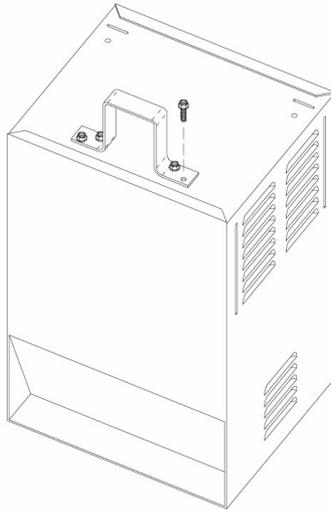
- 8.3 Recommended minimum AWG size for extension cord:
- 100 feet long or less - use a 10 gauge extension cord.
 - Over 100 feet long - use an 8 gauge extension cord.

9. ASSEMBLY INSTRUCTIONS

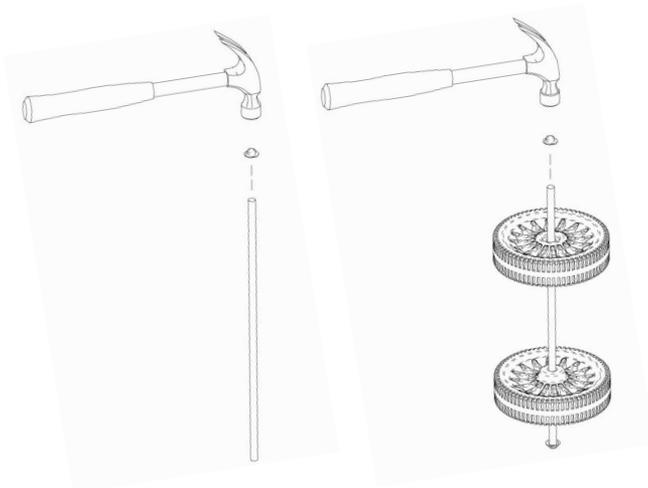
- 9.1 It is important to fully assemble your charger before use. Remove all cord wraps and uncoil the cables prior to using the battery charger. Follow these instructions for assembly.

PARTS	TOOLS NEEDED
(2) 10-32, thread cutting screws	3/8" wrench (for mounting foot)
(4) 1/4-20, thread cutting screws	5/16" wrench (for mounting wheels)
(4) Phillips head sheet metal screws	hammer
(2) wheels	screwdriver (flat blade)
(1) axle	screwdriver (Phillips)
(2) axle caps	
(2) axle brackets	
(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 four 1/4-20 thread cutting screws provided.

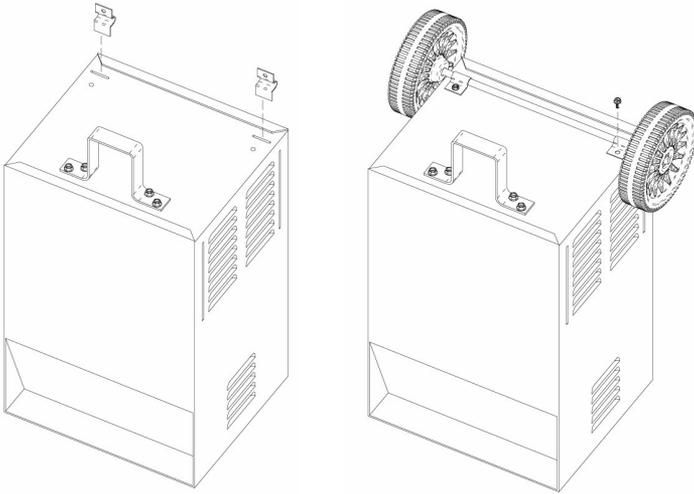


- 9.3 Assemble the Wheels and Axle:** Hold the axle upright on the floor or work surface. Then, using a hammer, tap one of the axle caps onto the top end of the axle. Be sure to tap the axle cap on straight. Slide both wheels onto the axle with the recessed hubs facing out as shown. Install the second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

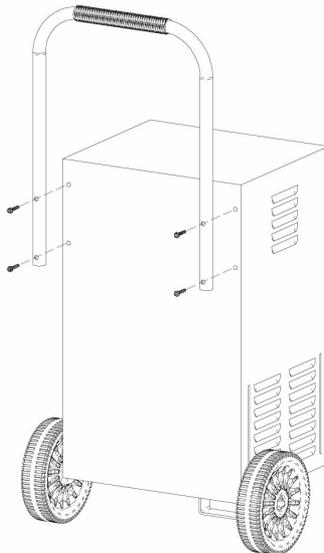


- 9.4 Mount the Axle to the Charger:** Place one end of each bracket into the slot on the bottom of the charger. Place the axle assembly under each bracket. Attach the brackets using the two, 10-32 thread cutting screws provided.

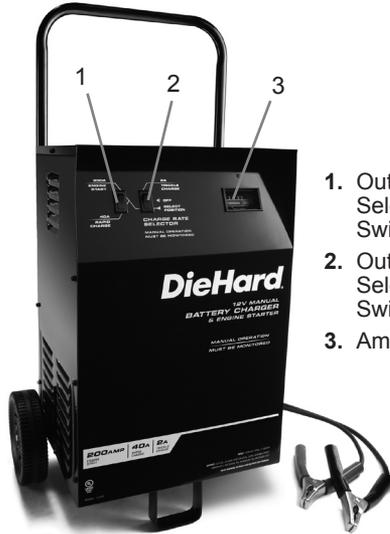
NOTE: Be careful not to drop the brackets inside of the charger case.



- 9.5 Attach the Handle:** If the charger came with a plastic grip, slide that onto the handle until it is centered at the top. Turn the charger right side up onto its foot and wheels. Align the handle so the screw holes are aligned with the screw holes on the upper back corners of the charger. Attach the handle using the four Phillips head screws provided.



10. FEATURES/CONTROL PANEL



1. Output Selector Switch #1
2. Output Selector Switch #2
3. Ammeter

Setting the Controls

All controls for your charger are located on the front of the unit. Follow these instructions to obtain the accurate charge level for your battery.

Output Selector Switches:

Two switches are used to select the rate of charge or function; a 3-position switch (switch #2) on the right, and a 2-position switch (switch #1) to the left of it.

- **Switch #1** - Use this switch to select the 200 Amp Engine Start and the 40 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 this switch to enable Switch #1. Note that Switch #1 is only effective when Switch #2 is set to "Select Position."

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.

11. OPERATING INSTRUCTIONS

⚠WARNING

This battery charger must be properly assembled in accordance with the assembly instructions before it is used.

Charging

1. Ensure that all of the charger components are in place and in good working condition, for example, the plastic boots on the battery clips. Make sure the electrolyte (battery liquid) in each cell is at the correct level.
2. Set the Output Selector Switch #2 to the OFF position.
3. Connect the battery following the precautions listed in sections 6 and 7.
4. Connect the A.C. power following the precautions listed in section 8.
5. Place the output selector switches #1 and #2 in the preferred position.
 - For the 2A charge rate, switch #1 is not used and switch #2 should be toggled up.
 - For the 40A charge rate, both switches #1 and #2 should be toggled down.
6. To disconnect the charger, reverse the procedure.

NOTE: This is a manual charger and will overcharge a battery if permitted to operate for extended periods of time. Monitor the charging progress often.

Manual Mode

Be sure to monitor the charging progress and stop it when the battery is fully charged. This charger is a manual charger and is not equipped with automatic shut off. Not doing so may cause damage to your battery or may cause other personal property damage or personal injury.

Using the Engine Start feature

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

⚠WARNING

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.

IMPORTANT

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.

1. Set Output Selector Switch #2 to the OFF position.
2. With the charger unplugged from the A.C. outlet, connect the charger to the battery following the instructions given in section 6: FOLLOW THESE STEPS WHEN BATTERY IS INSTALLED IN VEHICLE.
3. Plug the charger A.C. power cord into the A.C. outlet.
4. With the charger plugged in and connected to the battery of the vehicle, set the Output Selector Switch to the engine start position (switch #1 up, switch #2 down).
5. 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 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 Output Selector Switch #2 to the OFF position and unplug the A.C. power cord before disconnecting the battery clips 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.

12. CALCULATING CHARGE TIME

Use the following table to more accurately determine the time it will take to bring a battery to full charge. First, identify where your battery fits into the chart.

NR means that the charger setting is NOT RECOMMENDED.

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 - HOURS	
			2 AMP	40 AMP
SMALL BATTERIES	Motorcycle, garden, tractor, etc.	6 - 12 AH	2 - 4	NR
		12 - 32 AH	4 - 10	NR
CAR/TRUCKS	200 - 315 CCA	40 - 60 RC	11 - 14	30 to 45 min.
	315 - 550 CCA	60 - 85 RC	14 - 18	45 min - 1 hour
	550 - 1000 CCA	85 - 190 RC	18 - 35	1 - 2 hours
MARINE/DEEP CYCLE		80 RC	18	NR
		140 RC	27	NR
		160 RC	30	NR
		180 RC	33	NR

13. MAINTENANCE INSTRUCTIONS

- 13.1 After use and before performing maintenance, unplug and disconnect the battery charger (see sections 6, 7 and 8).
- 13.2 Use a dry cloth to wipe all battery corrosion and other dirt or oil from the battery clips, cords, and the charger case.
- 13.3 Ensure that all of the charger components are in place and in good working condition, for example, the plastic boots on the battery clips.
- 13.4 Servicing does not require opening the unit, as there are no user-serviceable parts.
- 13.5 All other servicing should be performed by qualified service personal.

14. MOVING AND STORAGE INSTRUCTIONS

- 14.1** Store the charger unplugged, in an upright position. The cord will still conduct electricity until it is unplugged from the outlet.
- 14.2** Store inside, in a cool, dry place.
- 14.3** Do not store the clips on the handle, clipped together, on or around metal, or clipped to cables.
- 14.4** 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.

15. TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	REASON/SOLUTION
No reading on the ammeter.	Charger is not plugged in. No power at the receptacle. Clips are not making a good connection to the battery. Connections are reversed. Battery is defective (will not accept a charge). 2 amp charge rate is being used.	Plug the charger into an AC outlet. Check for open fuse or circuit breaker supplying AC outlet. Check for poor connection to battery and frame. Make sure connection points are clean. Rock the clips back and forth for a better connection. Unplug the charger and reverse the clips. Have battery checked. Ammeter may show no activity at the 2A charge rate.
Ammeter reading stays high.	Battery is severely discharged. Wrong battery voltage.	Continue charging battery for two more hours. If problem continues have the battery checked. Verify that you are charging a 12 volt lead-acid battery.
Ammeter reads less than selected charge rate when charging a discharged battery.	Extension cord is too long or wire gauge is too small. Weak cell or sulfated plate in battery. Battery is only partially discharged.	Use a shorter or heavier gauge extension cord. A sulfated battery will eventually take a normal charge if left connected. If the battery will not take a charge, have it checked. 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 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.
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 5 seconds.
	Failure to wait 4 minutes between cranks.	Wait 4 minutes of rest time before the next crank.
	Clips 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 in the 40 amp manual rate to help assist in cranking.

PROBLEM	POSSIBLE CAUSE	REASON/SOLUTION
Charger will not turn on when properly connected.	AC outlet is dead. Poor electrical connection.	Check for open fuse or circuit breaker supplying AC outlet. 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 the 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.

16. BEFORE RETURNING FOR REPAIRS

- 16.1** 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 volts, 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.
- 16.2** 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.
- 16.3** When an UNKNOWN OPERATING PROBLEM arises, please read this complete manual and call the customer service number for information that will usually eliminate the need for return.

If the above solutions do not eliminate the problem, or for information about troubleshooting or replacement parts, call toll-free from anywhere in the U.S.A.

1-800-732-7764

7:00 am to 5:00 pm Central Time Monday through Friday