

OWNER'S MANUAL

DieHard®

20/15/10/2 AMP FULLY AUTOMATIC BATTERY CHARGER

Model No.
200.713201



CAUTION:

Before first use of charger, read this manual, and follow all its Safety and Operating Instructions with every charger use.

Save these instructions.

Made in U.S.A. of U.S. and imported parts.

Sears, Roebuck and Co., Hoffman Estates, IL 60179 U.S.A.

600-198

SAFETY

OPERATION

MAINTENANCE

TROUBLESHOOTING

PARTS

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Please read this Owner's Manual before using your Battery Charger

The DieHard model 200.713201, Fully Automatic Battery Charger, offers a wide range of features for home or light commercial use. This manual will show you how to use your charger safely and effectively. Please read and follow these instructions and precautions carefully.

WARRANTY

FULL THREE YEAR WARRANTY

Within three years from the date of purchase, if this battery charger fails due to a defect in materials or workmanship, **RETURN IT TO THE PLACE OF PURCHASE**, and it will be repaired or replaced free of charge.

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

Sears, Roebuck and Co., Dept. 817WA, Hoffman Estates, IL 60179

IMPORTANT SAFETY INSTRUCTIONS

WARNING: To reduce the risk of explosion, explosive gases, or injury while using your battery charger, follow the precautions listed below:

- Read all instructions and cautions printed on the battery charger, battery, and vehicle or equipment using battery.
- Use charger only on lead-acid type rechargeable batteries, such as those used in cars, trucks, tractors, airplanes, vans, RV's, trolling motors, etc. This charger is not intended to supply power to a low voltage electrical system.
- Use only attachments recommended or sold by manufacturer. The use of attachments not recommended by the manufacturer may result in fire, electric shock, or injury.
- Do not disassemble charger. Take it to a qualified service professional if service or repair is required. Incorrect assembly may result in fire or electrical shock.
- To reduce risk of electrical shock, unplug the charger from the outlet before attempting any maintenance or cleaning.
- Always charge battery in a well ventilated area.
- Battery chargers get hot during operation and must have proper ventilation. Air needs to flow around entire charger.
- Do not set charger on flammable materials like carpeting, upholstery, paper, cardboard etc. Charger may damage leather and melt plastic and rubber.

HELP US HELP YOU —

Remember:

- **Place** charger as far away from battery being charged as the charger cables will permit.
- **Do not** expose charger to rain or snow.
- **Never** charge a frozen battery. If battery fluid (electrolyte) becomes frozen, bring battery into a warm area to thaw before you begin charging.
- **Never** allow battery acid to drip on charger when reading specific gravity or filling battery.
- **Never** set a battery on top of the charger.
- **Never** place charger directly above battery being charged. The gases from the battery will corrode and damage the charger.
- **Never** use charger for charging dry cell batteries that are commonly used with home appliances like radios, stereos, remote controls, etc. These batteries may burst and cause personal injury.
- **Never** touch the battery clamps together when the charger is on. You will cause a spark.
- **Never** operate charger if it has received a hard blow, been dropped, or otherwise damaged. Take it to a qualified professional for inspection and repair.
- **Be sure** to position the charger power cord to prevent it from being stepped on, tripped over, or damaged.
- **Never** pull out the plug by the cord when unplugging the charger. Pulling on the cord may cause damage to the cord or the plug.
- **Do not** operate the charger if it has a damaged power cord or plug. Have the cord replaced.

PERSONAL SAFETY PRECAUTIONS

For your own personal safety, please follow the following precautions:

- **Wear complete eye and clothing protection** when working with lead-acid batteries.
- **Be sure** that someone is within range of your voice to come to your aid if needed while you work with or are near a lead-acid battery.
- **Have plenty of fresh water and soap** nearby for use in case battery acid contacts your eyes, skin, or clothing. If this happens, wash immediately with soap and water. Then get medical attention.
- **Avoid touching your eyes** while working with a battery. Acid particles (corrosion) may get into your eyes. If this occurs, flush eyes immediately with running cold water for at least 10 minutes. Then immediately get medical attention.
- **Remove all personal metal items** from your body, such as rings, bracelets, necklaces, and watches while working with a lead-acid battery. A battery can produce a short circuit current high enough to weld a ring (or the like) to metal, causing a severe burn.
- **Take care** not to drop any metal tool or metal object onto the battery. This may spark or short circuit the battery or another electrical device that may cause an explosion.
- **Always** operate your battery charger in an open, well ventilated area.
- **Never** smoke or allow a spark or flame in the vicinity of the battery or engine. Batteries generate explosive gases.
- **Neutralize** any acid spills thoroughly with baking soda before attempting to clean up.

BEFORE USING YOUR BATTERY CHARGER

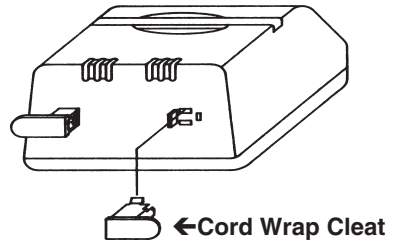
It is important to understand your charger's requirements. This section will tell you about your charger's electrical requirements and how to prepare a battery for charging.

ASSEMBLING YOUR CHARGER

Included with your battery charger are two cord wrap posts for storage of the clamp cables.

To install, align the three tabs to correspond with the three receptacles and push until you hear a snap.

Wrap clamp cord after unplugging the power cord and store your charger in a dry location.

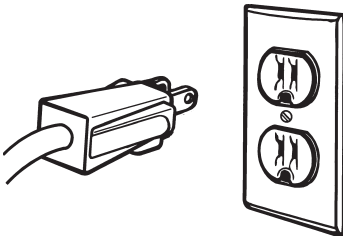


PLUGGING IT IN

WARNING: Electrical Shock Hazard. Be sure that the power cord fits properly into the outlet. If not, have a qualified technician install a proper outlet. Never alter the AC cord or plug provided.

Improper connection can result in electrical shock.

Your charger requires a 120V receptacle installed according to all local codes and ordinances.



USING AN EXTENSION CORD

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

- Make sure that the pins on charger's power cord fit firmly into the extension cord, and that the extension cord fits firmly into the receptacle.
- Check that the extension cord is properly wired and in good electrical condition.
- Make sure that the wire size is large enough for its length and for the AC ampere rating as specified in the chart below.

MINIMUM RECOMMENDED EXTENSION CORD				
Length of Cord, in Feet	25	50	100	150
AWG* Size of Cord	18	16	12	10

*AWG=American Wire Gauge

PREPARING YOUR BATTERY TO BE CHARGED

It is important that you read and follow these guidelines while you are preparing to charge your battery.

- Make sure that you have a 12 volt or 24 volt lead-acid battery. Set the selector switch to match the voltage rating of the battery to be charged.
- Clean the battery terminals. Be careful to keep corrosion from getting in or around your eyes.
- For batteries with removable cell caps, if required by the manufacturer, add distilled water to each cell until the battery acid reaches the level recommended. This will help purge excessive gases from the cells. Be careful not to overfill. If you have a sealed battery without cell caps, no action is necessary. Continue to the next step listed below.
- Take time to read all battery manufacturer's specific precautions,

such as removing or not removing cell caps while charging, and recommended rates of charge.

- Wear safety glasses. See additional "Personal Safety Precautions" on page 4.
- Be sure that the area around the battery is well ventilated while it is being charged.
- If it is necessary to remove the battery from the vehicle to charge it, always remove the grounded terminal from the battery first. Turn off all vehicle accessories to avoid sparks from occurring.

NOTE: A marine battery installed in a boat must be removed and charged on shore.

USING YOUR BATTERY CHARGER

To obtain the best results from your battery charger, you must know how to use it properly. This section will tell you how to set the controls, and how you can charge a battery while it is still in the vehicle, or you can remove it and then charge it. Follow the instructions below depending on how you choose to charge your battery.

SETTING THE CONTROLS

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

SELECTOR SWITCHES:

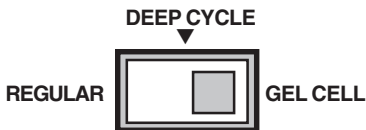
Your charger has four switches:

- The switch on the top right is used to select the type of battery being charged — REGULAR, DEEP CYCLE, or GEL CELL.
- The switch on the left is used to select the battery voltage— either 12 or 24 volt.

- The center switch controls the type of charge you want — AUTOMATIC, MANUAL, or MAINTAINER.
- The switch on the lower right selects the charge rate:
 - 2 AMP charge for 12 VOLT batteries/24 VOLT systems.
 - 10 AMP charge for 12 VOLT batteries/ 24 VOLT systems.
 - 20 AMP for 12 VOLT batteries or 15 AMP for 24 VOLT systems. The battery voltage selection (12 or 24 volt) will automatically determine whether the 20 or the 15 amp charge rate is used.

Battery Type:

The charger is designed to provide a specific charge best suited for charging each type of battery. Charging a GEL CELL battery as a REGULAR or DEEP CYCLE battery can permanently damage it. Charging a battery on anything but the proper selection can result in a partial charge or damaged battery. DO NOT charge a Gel Cell on any other setting but, Gel Cell.



Battery Voltage:

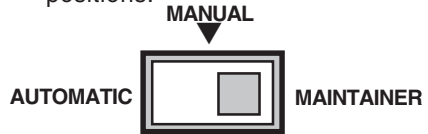
Select the voltage of your battery. The most common applications will be 12 volt, but 24 volt battery systems are being widely used in special applications.



Charge Type:

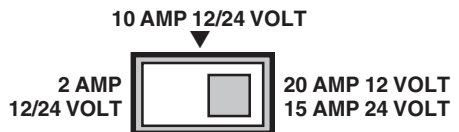
- Use the MANUAL setting only if you check the charging progress frequently. The charger will not stop charging when the battery reaches full charge, possibly damaging the battery if left on too long. A severely discharged battery may not have enough charge to start the control circuit in an automatic setting. In this case, charge on MANUAL until the battery has enough charge to accept an Automatic setting.
- Use the AUTOMATIC setting for all batteries and charge rates. The charger will automatically stop charging when the battery reaches full charge and begin charging again when battery requires.
- Use the MAINTAINER to maintain a charge in batteries stored for long periods, such as those in RVs,

seasonal farm equipment and the like. Use after fully charging the battery in one of the charging positions.



Charge Rate:

- Use the 2 AMP charge rate when you can afford the time. The lower the charge rate, the longer it will take, but the battery is subjected to much less stress. Unless a Gel Cell battery manufacturer recommends otherwise, use the 2 AMP rate for charging.
- Use the 10 AMP 12/24 VOLT rate for most common charging applications. It provides the most complete charge with the least stress on the battery.
- Use the 20 AMP 12 VOLT rate when speed is important. This rate is selected when 12 VOLT is selected on the Battery Voltage switch. It provides a faster charge than the 10 AMP rate. The 15 AMP 24 VOLT rate is selected when 24 VOLT is selected on the Battery Voltage switch.



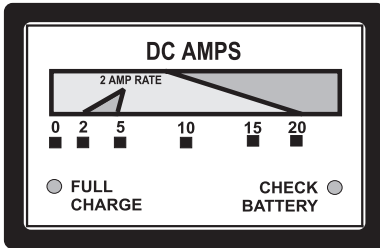
AMMETER:

The ammeter indicates the measure amount of amperes being drawn by the battery. When you first start charging a battery, the reading will be high, with the needle near 20 using the 20 amp charging rate.

- In the MANUAL setting, as the battery charges, the needle will fall to about 8 or 10 amps, indicating a charged battery.
- In both AUTOMATIC settings, the meter needle will fall to zero when the battery has completed the charging cycle. A

freshly charged battery's voltage will drop shortly after charging stops, and the charger, if left connected, may resume charging. This off-and-on cycling will continue until the battery's voltage no longer drops enough to restart the charger.

- At the 2 amp charging rate you will notice very little needle movement.



LED INDICATORS:

Two LED INDICATORS provide information on the state-of-charge by glowing steadily or blinking at different intervals.

GREEN, FAST BLINK:

When the charger is charging a battery, the green LED indicator will blink rapidly.

GREEN, STEADY GLOW:

In all settings, the green LED indicator will glow when the charging cycle is complete. In the MANUAL setting, stop charging when the green LED indicator glows steadily.

GREEN, SLOW BLINK:

A slowly blinking green LED indicates that the charger is maintaining the battery's state of charge in the MAINTAINER mode.

RED, STEADY GLOW:

When the red LED indicator glows steadily, it means that the charger has not sensed a battery voltage. The leads may be reversed on the posts, or one or both connections may not be making solid contact. Check your connections.

RED, SLOW BLINK:

The charger has sensed a battery condition which prevents further charging. Have the battery checked by a Sears technician.

CHARGING YOUR BATTERY

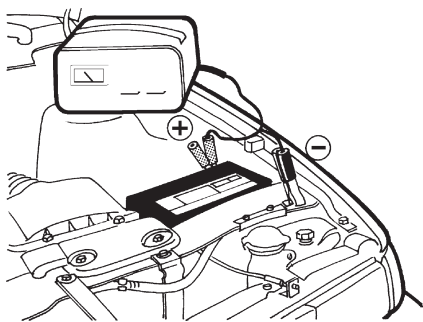
Charging your battery inside the vehicle:

1. Arrange the power cord and charging leads carefully in order to avoid damage that could be caused by the hood, door, or moving engine parts.
2. Keep clear of the fan blades, belts, pulleys, and other parts that can cause injury.
3. Check the polarity of the battery posts using the identification marks on the battery case: POSITIVE (POS, P, +) and NEGATIVE (NEG, N, -). **NOTE:** The positive post on top-post batteries is usually larger than the negative post.
4. Identify which battery post is the ground or connected to the chassis. **THE NEGATIVE POST IS NORMALLY THE ONE THAT IS GROUNDED.**

5. **To charge a negative grounded post system:** Connect the red (POSITIVE) charger clamp to the ungrounded POSITIVE (POS, P, +) post of the battery. Rock or twist the clamps back and forth to make a solid connection. Next, connect the black (NEGATIVE) clamp to a heavy unpainted metal part of the chassis or engine block, away from the battery. DO NOT connect clamp to carburetor, fuel lines, or sheet metal parts. (See Figure A.)

To charge a positive grounded post system: Connect the black (NEGATIVE) charger clamp to the NEGATIVE (NEG, N, -) ungrounded post of the battery. Then connect the red (POSITIVE) clamp to a heavy unpainted metal part of the chassis or engine block, away from the battery. DO NOT connect clamp to carburetor, fuel lines or sheet metal parts.

IMPORTANT: Wear safety glasses and turn face away from the battery when making connections.



NEGATIVE GROUNDED SYSTEM

Figure A

6. Set the Selector Switches to the desired settings. (See "Setting the Controls" on page 6.)
7. Plug the power cord into an AC outlet. The green LED indicator should blink rapidly to indicate that the battery is being charged.
8. When the battery is fully charged, the green LED indicator will glow steadily.
 - If an AUTOMATIC setting is used, the charger will automatically stop charging.
 - If a MANUAL setting is used, you must monitor the charging and stop the charger manually.
9. When the battery is fully charged, first unplug the charger power cord. Then, standing away from the battery, remove the charger clamp from the chassis first, then from the battery post.
10. Clean and store the battery charger in a dry location.

Charging your battery outside the vehicle:

1. Remove the battery from vehicle, making sure to disconnect grounded terminal first with all power turned off to the vehicle.
2. Check the polarity of the battery posts as indicated on the battery case:

POSITIVE (POS, P, +) and NEGATIVE (NEG, N, -). NOTE: On top-post batteries, the positive battery terminal usually has a larger diameter than the negative one.

3. Connect the red (POSITIVE) charger clamp to the POSITIVE post of the battery. Be sure to rock the clip back and forth to make a solid connection.
4. Attach a 6-gauge (AWG) or a 4-gauge (SAE) insulated battery cable of at least 24-inches long to the NEGATIVE battery post. This cable will provide a safer connection if arcing and sparking occur, it will be at a distance from the battery. **NOTE:** The battery cable is not provided with the charger, but may be purchased at most automotive stores.
5. Take the other end of the 6-gauge (AWG) or a 4-gauge (SAE) insulated 24-inch cable and, standing as far away from the battery as possible, connect the black (NEGATIVE) lead to the free end of the cable. Rock the clamp to make a solid connection. **IMPORTANT:** Wear safety glasses and face away from the battery while making the final connection.
6. Set the Selector Switches to the desired settings. (See "Setting the Controls" on page 6.)
7. Plug the power cord into an AC outlet. The green LED indicator should blink rapidly to indicate that the battery is being charged.
8. When the battery is fully charged, the green LED indicator will glow steadily.
 - If an AUTOMATIC setting is used, the charger will automatically stop charging and will restart if battery voltage drops too low.
 - If a MANUAL setting is used, you **must** monitor the charging and **stop the charger manually.**
9. When the battery is fully charged, unplug the charger power cord.

10. Standing away from the battery, remove the negative lead from the insulated cable connected to the NEGATIVE post first. Then remove the lead from the POSITIVE post.
11. Clean and store the battery charger in a dry location.

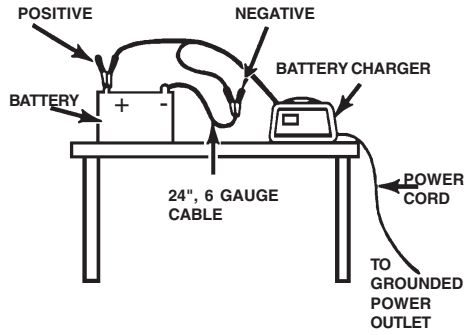


Figure B

CALCULATING CHARGE TIME

Battery Rating Method

Use the following table to more accurately determine the time it will take to fully charge a battery that is initially at 50% State-of-Charge. Identify your battery type and its associated Charge Time in the table. Common battery types are:

- Small batteries, motorcycles, garden tractors, etc., are usually rated in Amp-Hours (**AH**).
- Car and truck batteries, usually rated in Reserve Capacity (**RC**), Cold Cranking Amps (**CCA**), or both.
- Marine, or deep cycle batteries, usually rated in either Amp-Hours or Reserve Capacity (**RC**).
- **NR** means the charger setting is NOT RECOMMENDED.
- **NA** means not allowed. DO NOT charge at this setting

Charge Time Table for Batteries at 50% State-of-Charge

Battery Type	Battery Rating			Charge-Time (Hours)			
	AH	RC	CCA	2 AMP	10 AMP	15 AMP	20 AMP
Motorcycle and tractor	6 - 12			2 - 4	NA	NA	NA
	12 - 32			4 - 10	NA	NA	NA
Car and Truck		40 - 60	200 - 315	8 - 11	1 - 2	1 - 1½	¾ - 1
		60 - 85	315 - 550	11 - 16	2 - 3	1½ - 2	1 - 1½
		85 - 190	550 - 1000	16 - 35	3 - 7	2 - 5	1½ - 3½
Marine and Deep Cycle	40	80		15	3	2	1½
	80	140		26	5	3½	2½
	95	160		30	6	4	3
	105	180		33	7	4½	3½
Gel Cell	40		390	20	6	NR	NR
	80		650	32	10	NR	NR

Voltmeter Method

To find the time needed to fully charge your battery, determine the battery's charge level with a voltmeter or electronic State-of-Charge Tester. Use the table below to convert Voltmeter and State-of-Charge readings at room temperature to the appropriate Charge Factor. Then use the formulas that follow the table to determine the approximate Charge Time.

Charge Factor Table

Voltmeter Reading		State-of-Charge Reading	Charge Factor
12 Volt Battery	24 Volt Battery		
12.67	25.34	100%	0
12.45	24.90	75%	0.25
12.25	24.50	50%	0.50
12.03	24.06	25%	0.75
11.86	23.72	100%	1

Charge Time Needed if Amp-Hours is Known

- Find the Charge Factor for your battery in the table on page 11.
- Multiply by the Amp-Hour rating of the battery.
- Divide by the Charger Setting (either 2 Amp, 10 Amp or 20 Amp).
- Multiply by 1.25 to get the approximate *Hours Needed* to bring the battery to full charge.

Example: 15 Amp-Hour (AH) Battery, 50% State-of-Charge,
2 Amp Charger Setting

$$[(AH \times \text{Charge Factor}) \div \text{Charger Setting}] \times 1.25 = \text{Hours Needed}$$
$$(15 \times 0.5 \div 2) \times 1.25 = 4.7 \text{ Hours}$$

Charge Time Needed if Reserve Capacity is Known

- Find the Charge Factor for your battery in the table on page 11.
- Multiply by the Reserve Capacity rating of the battery.
- Divide by the Charger Setting (either 2 Amp, 10 Amp or 20 Amp).
- Multiply by 0.73 to get the approximate *Hours Needed* to bring the battery to full charge.

Example: 95-Minute Reserve Capacity (RC) Battery, 25%
State-of-Charge, 20 Amp Charger Setting

$$[(RC \times \text{Charge Factor}) \div \text{Charger Setting}] \times 0.73 = \text{Hours Needed}$$
$$[(95 \times 0.75) \div 20] \times 0.73 = 2.6 \text{ Hours}$$

MAINTENANCE AND CARE

To keep your battery charger working properly for years:

1. 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.
2. Coil the input and output cords neatly when storing the charger. This will help prevent accidental damage to the cords and charger.

TROUBLESHOOTING

Performance problems often result from little things that you can fix yourself. Please read through this chart for a possible solution if a problem occurs.

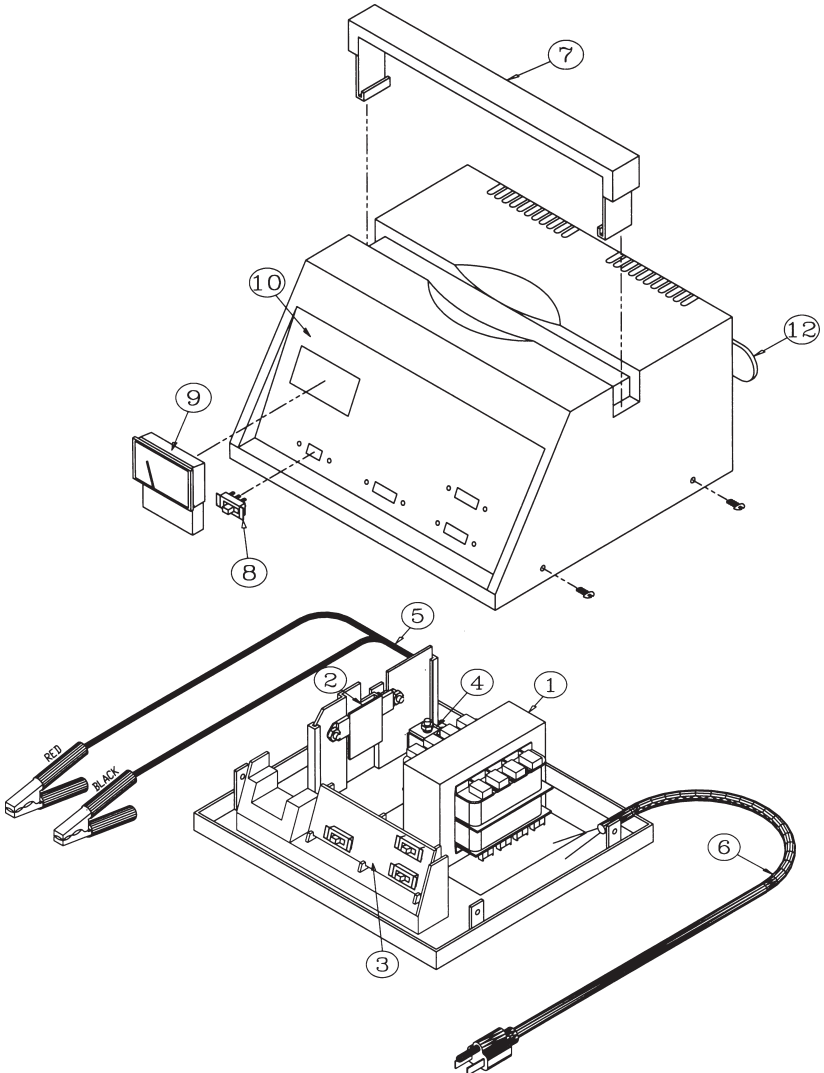
PROBLEM	POSSIBLE CAUSE	SOLUTION/REASON
No ammeter reading.	Clamps not making good connection.	Check for poor connection at battery. Make sure clamps and posts are clean. Battery may not accept an AUTOMATIC charge if severely discharged. Use MANUAL setting, see "Using Your Battery Charger" on page 6.
	2-amp charge rate.	Ammeter needle will indicate little activity at the 2-amp charge rate.
	No AC power reaching charger.	Check AC outlet and extension cords for loose fitting plug. Check for open fuse or circuit breaker supplying AC outlet.
Circuit breaker in charger cycles on and off with a clicking sound in the MANUAL setting.	Shorted battery clamps.	Separate the clamps. Circuit breaker cycles when current draw is too high.
	Shorted battery.	Check for worn cables and replace if needed.
	Charger leads reversed on battery.	Have a Sears technician test the battery. Correct connections.
Ammeter reads less than selected charge rate when charging.	Extension cord too long or gauge too small.	Use shorter or heavier extension cord.
	Battery has weak cell or sulfated plate.	Sulfated battery will eventually take a normal charge if left connected. If the battery will not take a charge, have it tested by a Sears technician.
	Battery is partially charged.	Continue charging battery.
Charger makes a loud buzz or hum.	Transformer laminations vibrate (buzz).	Continue charging. Buzz is not abnormal.
Ammeter needle stays at the right side of the meter.	Battery severely discharged.	Continue charging battery for another two hours. If problem continues, consult a qualified technician.
	Battery size selector switch in the wrong position	Make sure size selection is in proper 12 or 24 volt position.

**If the above solutions do not eliminate the problem...call toll-free from anywhere in the U.S.A. 1-800-SEARS-64 • (1-800-732-7764)
7 AM to 4:30 PM CST Monday through Friday**

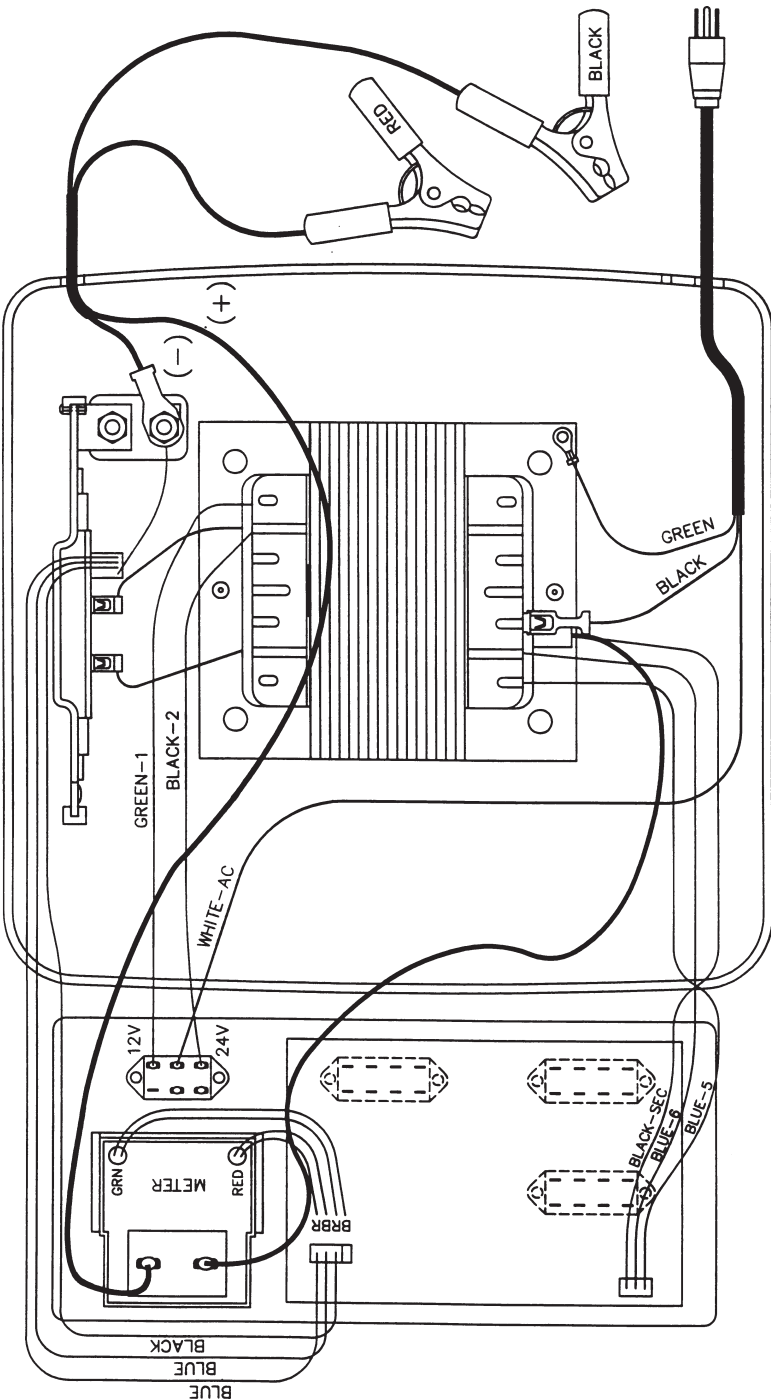
PARTS

This section shows an illustration of your battery charger. Use it to become familiar with where all the parts are located, and what they look like.

Replacement Parts List Model 713201					
Item	Description	Part Number	Item Description	Part Number	
1	Transformer	93026487	7	Handle	3599000270
2	SCR control Module	2299000992	8	Switch - left DPDT	0499000060
3	PC Board Asm (SWITCHES)	2299000991	9	Meter	5399100095
4	Circuit Breaker	3999000089	10	Faceplate	0899001078
5	Output Cord	3899000738	11	Owner's Manual	0000000600
6	AC Powercord	90026116	12	Cord Wrap Cleats	1199004390



WIRING DIAGRAM



For information about troubleshooting
Call toll-free from anywhere in the U.S.A.
7 am to 4:30 pm CST Monday through Friday
1-800-732-7764

**For the repair or replacement
parts you need**
Call 7 am - 7 pm, 7 days a week
1-800-366-PART
(1-800-366-7278)

**For the location of an authorized
Sears Service Center in your area**
Call 24 hours a day, 7 days a week
1-800-488-1222

**When requesting service or
ordering parts, always provide
the following information:**

- **Product Type: 20/15/10/2 AMP
Fully Automatic Battery Charger**
- **Model Number: 200.713201**
- **Part Number (See Page 14)**
- **Part Description (See Page 14)**

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