

OPERATOR'S MANUAL / MANUAL DEL USUARIO

# DieHard®



**12V Manual  
Battery Charger  
& Engine Starter**  
**12V Cargador  
de baterías manual  
y arrancador**

**Model / Modelo:  
28.71330**

**CAUTION:**

Read and follow all safety rules and operating instructions before every use of this product.

**SAVE THESE INSTRUCTIONS.**

**ATENCIÓN:**

Lea y siga todas las reglas de seguridad e instrucciones de uso antes de cada uso de este producto.

**GUARDE ESTAS INSTRUCCIONES.**

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

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### **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 1-800-SEARS-64 (1-800-732-7764) TOLL-FREE  
FROM 7 AM TO 5 PM CT.**

### **DIEHARD® TRES AÑOS DE GARANTÍA TOTAL**

Cuando se opere o maneje con las debidas precauciones de acuerdo a las instrucciones, si el DieHard® falla en alguno de sus componentes de fabricación durante los 3 años contados a partir de la fecha de compra, regresarlo al autoservicio DieHard® en los estados unidos para reemplazar el aparato sin costo alguno.

Esta garantía le otorga derechos legales específicos, así como otros derechos, que varían de estado a estado.

Sears Brands Management Corporation, Hoffman Estates, IL 60179

**PARA ASISTENCIA AL CLIENTE O REPUESTOS,  
LLAME GRATIS AL 7 AM-5 PM CT  
LUNES A VIERNES: 1-800-SEARS-64 (1-800-732-7764)**

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## 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 12V LEAD-ACID 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	10	10	10	8

\*AWG-American Wire Gauge

## 9. ASSEMBLY INSTRUCTIONS

- 9.1 Remove all cord wraps and uncoil the cables prior to using the battery charger.

- 9.2 Extend the handle from the retracted position by pulling it upward until it locks into place. (Press the small silver buttons inward, if necessary.)

## 10. FEATURES



1. Ammeter
2. LEFT selector switch (200A/40A)
3. RIGHT selector switch (enables 200A and 40A rates/OFF/2A)

## 11. CONTROL PANEL

### OUTPUT SELECTOR SWITCHES

Two switches are used to select the rate of charge or function; a 3-position switch on the **RIGHT**, and a 2-position switch on the **LEFT**.

- **Right selector switch** – Use this switch to select the 2 amp Charge Rate and the OFF position. Also, use this switch to enable the LEFT switch. Note that the LEFT switch is only effective when the RIGHT switch is set to “Rate Selection.”
- **Left selector switch** – Use this switch to select the 200 Amp Engine Start and the 40 Amp Charge Rate. The RIGHT switch must be in the “Rate Selection” position when using the LEFT switch.

### 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.

## 12. 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 RIGHT selector switch 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. Place the LEFT and RIGHT selector switches in the preferred positions.

- For the 2A charge rate, the LEFT switch is not used and the RIGHT switch should be toggled to the right.
- For the 40A charge rate, both switches should be toggled to the left.

#### 9. MONITOR THE CHARGER AND THE BATTERY.

10. When disconnecting the charger, set the RIGHT switch 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 RIGHT selector switch 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. Place the LEFT and RIGHT selector switches in the preferred positions.

- For the 2A charge rate, the LEFT switch is not used and the RIGHT switch should be toggled to the right.
- For the 40A charge rate, both switches should be toggled to the left.

#### 7. MONITOR THE CHARGER AND THE BATTERY.

8. When disconnecting the charger, set the RIGHT switch 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.
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 RIGHT switch 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.
4. With the charger plugged in and connected to the battery of the vehicle, set the switch to the Engine Start position. (Both switches toggled to the left).
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 RIGHT switch 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.

### FAN OPERATION

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

## 13. 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:

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

**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** = 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	
			2 AMP	40 AMP
SMALL BATTERIES	Motorcycle, garden tractor, etc.	6-12 Ah	2-3¼ hrs	NR
		12-32 Ah	3¾-10 hrs	NR
CARS/ TRUCKS	200-315 CCA	40-60 RC	11¼-14½ hrs	30-45 min
	315-550 CCA	60-85 RC	14½-18 hrs	45 min-1hr
	550-1000 CCA	85-190 RC	18-35 hrs	1-2 hrs
MARINE/DEEP-CYCLE		80 RC	NR	1¼ hrs
		140 RC	NR	NR
		160 RC	NR	NR
		180 RC	NR	NR

## 14. MAINTENANCE INSTRUCTIONS

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.

## 15. TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	REASON/SOLUTION
No reading on the ammeter.	<p>Charger is not plugged in.</p> <p>No power at the receptacle.</p> <p>Clamps are not making a good connection to the battery.</p> <p>Connections are reversed.</p> <p>Battery is defective (will not accept a charge).</p> <p>2 amp charge rate is being used.</p>	<p>Plug the charger into an AC outlet.</p> <p>Check for open fuse or circuit breaker supplying AC outlet.</p> <p>Check for poor connection to battery and frame. Make sure connection points are clean. Rock the clamps back and forth for a better connection.</p> <p>Unplug the charger and reverse the clamps.</p> <p>Have battery checked.</p> <p>Ammeter may show no activity at the 2A charge rate.</p>
Ammeter reading stays high.	<p>Battery is severely discharged.</p> <p>Wrong battery voltage.</p>	<p>Continue charging battery for two more hours. If problem continues, have the battery checked.</p> <p>Verify that you are charging a 12 volt lead-acid battery.</p>
Ammeter reads less than selected charge rate when charging a discharged battery.	<p>Extension cord is too long or wire gauge is too small.</p> <p>Weak cell or sulfated plate in battery.</p> <p>Battery is only partially discharged.</p>	<p>Use a shorter or heavier gauge extension cord.</p> <p>A sulfated battery will eventually take a normal charge if left connected. If the battery will not take a charge, have it checked.</p> <p>Continue to charge the battery.</p>
The charger is making an audible clicking sound.	<p>Circuit breaker is cycling.</p> <p>Battery is defective.</p> <p>Shorted battery cables or clips.</p> <p>Severely discharged battery, but otherwise it is a good battery.</p> <p>Reverse connections at battery.</p>	<p>The settings may be wrong. Check the charger settings.</p> <p>Have the battery checked.</p> <p>Circuit breaker cycles when current draw is too high. Check for shorted cables or clips and replace if necessary.</p> <p>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.</p> <p>Shut the charger off and correct the lead connections.</p>
Charger makes a loud buzz or hum.	<p>Transformer laminations vibrate (buzz).</p> <p>Shorted Diode Assembly or Output Rectifier Assembly (hum).</p>	<p>No problem, this is a normal condition.</p> <p>Have charger checked by a qualified technician.</p>

PROBLEM	POSSIBLE CAUSE	REASON/SOLUTION
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.
	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 in the 40 amp manual rate to help assist in cranking.	
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.
The battery is connected and the charger is on, but is not charging.	Clamps are not making a good connection.	Check for poor connection at battery and frame. Make sure connecting points are clean. Rock the clamps 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

- 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 clamps for correct polarity and the quality of the connections from the cables to the clamps and from the clamps to the battery system. The clamps must be clean.
- When an UNKNOWN OPERATING PROBLEM arises, please read the complete manual and call the customer service number for information. This 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 CT, Monday through Friday**