

OPERATOR'S MANUAL / MANUAL DEL USUARIO

# DieHard®



**12V Automatic  
Battery Charger  
& Engine Starter**

**Cargador de baterías  
automático 12V  
y arrancador**

**Model / Modelo:  
28.71331**

**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® LIMITED WARRANTY**

FOR THREE YEARS from the date of sale, this product is warranted against defects in material or workmanship when it is operated according to all supplied instructions.

WITH PROOF OF SALE, return a defective product to the retailer from which it was purchased 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, MONDAY-FRIDAY.**

#### **GARANTÍA LIMITADA DIEHARD®**

DURANTE TRES AÑOS desde la fecha de venta, este producto está garantizado contra defectos de materiales o mano de obra cuando se opera de acuerdo a las instrucciones provistas.

CON EL COMPROBANTE DE VENTA, devolver un producto defectuoso a la tienda donde fue comprado para el reemplazo gratuito.

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

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**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 Keep out of reach of children.

#### 1.3 Do not expose the charger to rain or snow.

#### 1.4 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.

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

#### 1.6 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:

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

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

#### 1.8 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.

#### 1.9 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.

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

#### 1.11 **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 markings on these products and on engine.

#### 1.12 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 the battery charger on LEAD-ACID and AGM-type rechargeable batteries with recommended rated capacities of 22-59Ah (12V). 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 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 gauge 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 gauge 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	14	12	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. CONTROL PANEL

### ON/OFF SWITCH

Use this switch to select between the Charge/Maintain rate, Boost rate and the Engine Start mode.

- **OFF** – When the switch is in this position (middle), the charger is turned off.
- **BOOST or CHARGE/MAINTAIN** – When the switch is in this position, the Rate Selection button can be set to either the Charge/Maintain 6A<>2A or the Boost 40A setting.
- **ENGINE START** – When the switch is in this position, the Engine Start LED will illuminate.

### RATE SELECTION BUTTON

Use this button to select one of the following:

- **6A<>2A CHARGE/MAINTAIN** – For charging small and large batteries. Not recommended for industrial applications.
- **40A BOOST** – For quickly adding energy to a severely discharged or large capacity battery prior to ENGINE START.
- **200A ENGINE START** – Provides 200 amps for cranking an engine with a weak or run-down battery. Always use in combination with a battery.

## LED INDICATORS

### CLAMPS REVERSED (red) LED

**flashing:** The connections are reversed.

### BOOST/CHARGING (yellow/orange)

**LED lit:** The charger has detected that a battery is connected, and is performing the selected operation—either Boost or Charge.

### BOOST/CHARGING (yellow/orange) LED

**flashing:** The charger is in abort mode.

### CHARGED/MAINTAINING (green) LED

**pulsing:** The battery is fully charged and the charger is in maintain mode.

**NOTE:** See *Operating Instructions* for a complete description of the charger modes.

## 11. OPERATING INSTRUCTIONS

**WARNING:** A spark near the battery may cause an explosion.

**WARNING:** When the unit is in either the Boost/Charge or Engine Start mode, the clamps are energized and will spark if touched together.

### 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 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. With the charger plugged in and connected to the battery of the vehicle, set the switch to the Boost or Charge/Maintain position.
9. Select the desired rate.
10. When disconnecting the charger, set the 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. First, place battery in a well-ventilated area.
2. Set the 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. With the charger plugged in and connected to the battery of the vehicle, set the switch to the Boost or Charge/Maintain position.
7. Select the desired rate.
8. When disconnecting the charger, set the switch 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.

### 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 will damage 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 will damage the vehicle's electrical system. Have the battery checked.

1. Set the 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 *Charging A Battery in the Vehicle*.
3. Plug the charger AC power cord into the AC outlet.
4. With the charger plugged in and connected to the battery of the vehicle, set the ON/OFF switch to the Engine Start position. The Engine Start LED will illuminate.
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, boost the battery for 5 minutes before cranking the engine.

6. If the engine fails to start, use the 40A Boost rate for 5 minutes or more before attempting to crank the engine again.
7. After the engine starts, move the switch to the OFF position and unplug the AC 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 not 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.

**AUTOMATIC CHARGING MODE**

When an Automatic Charge is performed, the charger switches to the maintain mode automatically after the battery is charged.

**ABORTED CHARGE**

If charging cannot be completed normally, charging will abort. When charging aborts, the charger's output is shut off and the BOOST/CHARGING (yellow/orange) LED will flash. Do not continue attempting to charge this battery. Have it checked or replaced.

**DESULFATION MODE**

Desulfation could take 8 to 10 hours. If desulfation fails, charging will abort and the BOOST/CHARGING (yellow/orange) LED will flash.

**COMPLETION OF CHARGE**

Charge completion is indicated by the CHARGED/MAINTAINING (green) LED. When pulsing, the charger has switched to the maintain mode of operation.

**MAINTAIN MODE (FLOAT-MODE MONITORING)**

When the CHARGED/MAINTAINING (green) LED is pulsing, the charger has started maintain mode. In this mode, the charger keeps the battery fully charged by delivering a small current when necessary. If the charger has to provide its maximum maintain current for a continuous 12 hour period, it will go into abort mode (see *Aborted Charge* section). This is usually caused by a drain on the battery or the battery could be bad. Make sure there are no loads on the battery. If there are, remove them. If there are none, have the battery checked or replaced.

**MAINTAINING A BATTERY**

The 28.71331 charges and maintains 12 volt batteries, keeping them at full charge.

**NOTE:** The maintain mode technology allows you to safely charge and maintain a healthy battery for extended periods of time. However, problems with the battery, electrical problems in the vehicle, improper connections or other unanticipated conditions could cause excessive current draws. As such, occasionally monitoring your battery and the charging process is required.

**BATTERY CHARGING TIMES**

**CCA** = Cold Cranking Amps    **RC** = Reserve Capacity    **Ah** = Amp Hour

BATTERY SIZE/RATING			CHARGE RATE/TIME
			6A<->2A
SMALL BATTERIES		6-12 Ah	1½-2½ h
Motorcycle, garden tractor, etc.		12-32 Ah	2½-7 h
CARS AND TRUCKS	200-315 CCA	40-60 RC	7½-9½ h
	315-550 CCA	60-85 RC	9½-12 h
	550-1000 CCA	85-190 RC	MAINTAIN ONLY
MARINE/DEEP-CYCLE		80 RC	12 h
		140 RC	MAINTAIN ONLY
		160 RC	MAINTAIN ONLY
		180 RC	MAINTAIN ONLY

Times are based on a 50% discharged battery and may change, depending on age and condition of battery.

**12. 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.



## 13. 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.
	Battery is defective.	Have the battery checked.
The Boost-Charging LED is flashing.	The charger has stopped in Boost or Charge mode.	The charger cannot complete the boost or charge. Have the battery checked and replace, if necessary.
	The battery is bad.	Disconnect charger from the AC outlet and then remove the clamps. Do not continue to try to charge the battery. Have the battery checked and replace, if necessary.
The Boost-Charging LED does not turn off.	The charger is still in Boost or Charge mode.	This is normal. The Boost-Charging LED will not turn off until the battery is disconnected from the charger.
Charger does not detect a low voltage battery.	The charger was on for more than 5 minutes before it was connected to the battery.	The clamps are active for only the first 5 minutes. Switch to the OFF position and connect the charger to the battery. Set the switch to the Boost/Charge/Maintain position. Then push the rate selection button to turn on the charger.
Engine start does not work.	Drawing more than 200 amps.	Crank time varies with the amount of current drawn. If cranking draws more than 200 amps, crank time may be less than 5 seconds.
	Failure to wait 3 minutes (180 seconds) between cranks.	When the Engine Start LED blinks, wait 3 minutes of rest time before the next crank.
	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, use the 40A Boost rate for 10 to 15 minutes, to help assist in cranking.

## 14. 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**