

OPERATOR'S MANUAL / MANUAL DEL USUARIO

# DieHard®

## 6/12V Battery Charger & Engine Starter

## Cargador de baterías 6 o 12V y arrancador



Model / Modelo:  
28.71326

### 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.

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

### **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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## IMPORTANT SAFETY INSTRUCTIONS

### WARNING – RISK OF EXPLOSIVE GASES

WORKING IN THE VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL OPERATION. FOR THIS REASON, IT IS IMPORTANT THAT YOU FOLLOW THESE INSTRUCTIONS EACH TIME YOU USE THE CHARGER.

**To reduce the risk of a battery explosion, follow these instructions and those published by the manufacturer of the battery and any equipment you intend to use in the vicinity of the battery. Review the cautionary markings on these products and on the engine.**

**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. Wash hands after handling.

- Keep out of reach of children.
- Use the battery charger on LEAD-ACID, GEL and AGM-type rechargeable batteries with recommended rated capacities of 12Ah (6V) and 22-59Ah (12V), as used in automobiles, trucks, tractors, airplanes, vans, RVs, trolling motors, etc. This charger is not intended to supply power to low-voltage electrical systems, other than in a motor-starting application.

**WARNING:** Do not use battery charger with dry cell batteries that are commonly used with home appliances. These batteries may burst and cause injury or damage to property.

- Use only attachments recommended or sold by the battery charger's manufacturer. Use of non-recommended attachments may result in a fire, electric shock or injury.
- Locate the battery charger's power cord so it cannot be stepped on, tripped over, or subjected to damage or stress.
- 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 professional for inspection and repair.
- Do not disassemble the charger. Take it to a qualified professional when service or repair is required.

- To reduce the risk of electric shock, unplug the charger from the outlet before attempting any maintenance or cleaning.
- Do not use an extension cord.
- Always charge the battery in a well-ventilated area.
- Do not set the charger on flammable materials, such as carpeting, upholstery, paper, cardboard, etc.
- NEVER smoke or allow sparks or flames in the vicinity of the battery or engine.

#### **WARNING: RISK OF EXPLOSIVE GAS.**

- Operate the charger as far away from the battery as DC charger cables permit.
- Do not expose the charger to rain or snow.
- NEVER charge a frozen battery.
- NEVER set a battery on top of the charger.
- NEVER place the charger directly above a battery being charged. Gases from the battery will corrode and damage the charger.
- NEVER touch the battery clamps together when the charger is energized.
- When disconnecting the battery charger, pull by the plug, not by the cord. Pulling on the cord may cause damage to the cord or plug.
- Do not operate the charger with a damaged cord or plug.
- NEVER allow battery acid to drip onto the charger.
- NEVER overcharge a battery.

### PERSONAL SAFETY PRECAUTIONS

- Wear complete eye protection and protective clothing when working near lead-acid batteries. Always have someone nearby for help.
- Have plenty of fresh water, soap and baking soda nearby for use, in case battery acid contacts your eyes, skin, or clothing. Wash immediately with soap and water and seek medical attention.
- If battery acid comes in contact with eyes, flush eyes immediately for a minimum 10 minutes and get medical attention.
- Neutralize any acid spills thoroughly with baking soda before attempting to clean up.
- Remove all personal metal items from your body, such as rings, bracelets, necklaces and watches. A battery can produce a short circuit current high enough to weld a ring to metal, causing a severe burn.
- Do not drop a metal tool onto the battery.
- If it is necessary to remove the battery from the vehicle to charge it, always remove the grounded terminal first.

## ASSEMBLY INSTRUCTIONS

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

### 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.

**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 below:

Length of cord (feet)	25	50	100	150
AWG* size of cord	18	16	14	12

\*AWG-American Wire Gauge

### FEATURES/CONTROL PANEL

#### DIGITAL DISPLAY

The Digital Display gives a digital indication of voltage, % of charge or time. The display will show the battery VOLTAGE when the charger is not charging a battery. When it goes into charging mode, the display will automatically change to  $\square_n$  (to show charging has started) and either 6 or 12 (the voltage of the battery, determined by the charger). If you manually stop the charging process (by pressing the Rate Selection button) before the battery is fully charged, the display will show  $\square FF$ .

**NOTE:** During charging, the display will go into sleep mode and will not show the percentage of charge or voltage of the battery. To turn the display back on, press the Display button.

#### DISPLAY MODE BUTTON

Use this button to set the function of the digital display to one of the following:

- **Battery %** – The digital display shows an estimated charge percentage of the battery connected to the charger's battery clamps, when charging.
- **Alternator % (12V only)** – The digital display shows an estimated output percentage of the vehicle's charging system connected to the charger's battery clamps, compared to a properly functioning system. The alternator percent range is from 0% to 100%. Readings below 0% (13.2 volts) will read  $L \square$  and readings above 100% (14.6 volts) will read  $Hi$ . If you get a  $Hi$  or  $L \square$  reading, have the electrical system checked by a qualified technician.
- **Voltage** – The Digital Display shows the voltage at the charger battery clamps, in DC volts.

#### RATE SELECTION

Use this button to select one of the following:

- **6<>2A CHARGE/MAINTAIN** – For charging small and large batteries. Not recommended for industrial applications.
- **30<>12A BOOST** – This setting may be used for a quick boost, prior to using the engine start setting. Do not use this setting to charge your battery.
- **80A ENGINE START** – Provides additional amps for cranking an engine with a weak or run-down battery. Always use in combination with a battery.

**NOTE:** Once the charger has started charging the battery, if you press the Rate Selection button once, the output current is shut off and the display will show  $\square FF$  and then the battery voltage. If you press the Rate Selection button again, the current will go back on at the same setting it was when it was turned off.

#### LED INDICATORS

**CLAMPS REVERSED (red) LED flashing:** The connections are reversed.

**CHARGING (yellow) LED lit:** The charger is charging the battery.

**CHARGING (yellow) 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 the Operating Instructions section for a complete description of the charger modes.

## BATTERY TYPE BUTTON

This selects the type of battery to charge.

- **Standard** – Used in cars, trucks and motorcycles, these batteries have vent caps and are often marked “low maintenance” or “maintenance-free”. This type of battery is designed to deliver quick bursts of energy (such as starting engines) and has a greater plate count. The plates are thinner and have somewhat different material composition. Regular batteries should not be used for deep-cycle applications.
- **AGM** – The Absorbed Glass Mat construction allows the electrolyte to be suspended in close proximity with the plate’s active material. In theory, this enhances both the discharge and recharge efficiency. The AGM batteries are a variant of Sealed VRLA (valve regulated lead-acid) batteries. Popular uses include high-performance engine starting, power sports, deep-cycle, solar and storage batteries.
- **Gel** – The electrolyte in a GEL cell has a silica additive that causes it to set up or stiffen. The recharge voltages on this type of cell are lower than those for other styles of lead-acid battery. This is probably the most sensitive cell in terms of adverse reactions to overvoltage charging. Gel batteries are best used in VERY DEEP cycle application and may last a bit longer in hot weather applications. If the wrong battery charger is used on a gel cell battery, poor performance and premature failure will result.

## OPERATING INSTRUCTIONS

**WARNING:** A spark near battery may cause a battery explosion.

**IMPORTANT:** Do not start the vehicle with the charger connected to the AC outlet, or it could result in damage to the charger

### 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. Place the charger on a dry, non-flammable surface.
5. Lay the AC/DC cables away from any fan blades, belts, pulleys and other moving parts.
6. For a negative-ground vehicle (as in most vehicles), connect the charger’s POSITIVE (RED) clamp to the POSITIVE (POS, P, +) battery post. Next, connect the charger’s NEGATIVE (BLACK) clamp to the vehicle chassis or engine block, away from the battery.
7. For a positive-ground vehicle, connect the charger’s NEGATIVE (BLACK) clamp to the NEGATIVE (NEG, N, -) battery post. Next, connect the charger’s POSITIVE (RED) clamp to the vehicle chassis or engine block away from the battery. NEVER connect any clamps to the carburetor, fuel lines or sheet-metal body parts.
8. Connect the charger to an electrical outlet.
9. Select the battery type and charge rate.
10. When charging is complete, disconnect the charger from the AC power, remove the clamps from the vehicle’s 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. Clean the battery terminals.
3. Connect a 24-inch long, 6-gauge (AWG) insulated battery cable to the NEGATIVE (NEG, N, -) battery post (i.e., jumper cable) (not provided).
4. Connect the POSITIVE (RED) clamp to the POSITIVE (POS, P, +) battery post.
5. Position yourself and the “negative post extension” cable as far away from the battery as possible, and connect the NEGATIVE (BLACK) clamp to the cable’s free end.
6. Connect the charger to the electrical outlet.
7. Select the battery type and charge rate.
8. When charging is complete, 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.

**NOTE:** This charger is equipped with an auto-start feature. Current will not be supplied to the battery clamps until a battery is properly connected. The clamps will not spark if touched together.

### 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 CHARGING (yellow) LED will flash. The digital display will show an error code (see the Troubleshooting section for a description of the error codes). To reset after an aborted charge, unplug the charger from the AC outlet, wait a few moments and then plug it back in.

## DESULFATION MODE

Desulfation could take 8 to 10 hours. If desulfation fails, charging will abort and the CHARGING (yellow) 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 lit, 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.

## MAINTAINING A BATTERY

The 28.71326 charges and maintains both 6 and 12 volt batteries.

**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.

## 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. 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.
2. Plug the charger AC power cord into the AC outlet.
3. With the charger plugged in and connected to the battery and chassis, press the RATE SELECTION button until the ENGINE START LED is lit.
4. Crank the engine until it starts or 3 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.

5. If the engine fails to start, charge the battery for 5 more minutes before attempting to crank the engine again.
6. After the engine starts, unplug the AC power cord before disconnecting the battery clamps from the vehicle.
7. 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.

## ENGINE STARTING NOTES

During the starting sequence listed above, the charger is set to one of three states:

- **Wait for cranking** – While waiting for cranking, the digital display shows *r d d*. The charger waits until the engine is actually being cranked before delivering the amps for engine start.
- **Cranking** – When cranking is detected, the charger will automatically deliver up to its maximum output as required by the starting system for up to 5 seconds. The digital display shows a countdown of the remaining crank time.
- **Cool Down** – After cranking, the charger enters a mandatory 3 minute (180 second) cool down state. The digital display indicates the remaining cool down time in seconds. It starts at 180 and counts down to 0. After 3 minutes, the digital display will change from displaying the countdown to displaying *r d d*.



## USING THE BATTERY VOLTAGE TESTER

1. With the charger unplugged from the AC outlet, connect the charger to the battery, following the instructions given in previous sections.
2. Plug the charger AC power cord into the AC outlet.
3. If necessary, press the BATTERY TYPE button until the correct type is indicated.
4. Read the voltage on the digital display. Keep in mind that this reading is only a battery voltage reading; a false surface charge may mislead you. Compare the reading to the following chart.

6V Battery Voltage Reading	12V Battery Voltage Reading	Battery Condition
6.4 or More	12.8 or More	Charged
6.1 to 6.3	12.2 to 12.7	Needs Charging
Less than 6.1	Less than 12.2	Discharged

## TESTER AND CHARGER

When first turned on, the unit operates only as a tester, not as a charger. Selecting a charge rate activates the battery charger and deactivates the tester. Pressing the RATE SELECTION button when the ENGINE START LED is lit (except during the 180 second cool down) will shut off the charger and activate the tester.

## POWER-UP IDLE TIME LIMIT

If no button is pressed within 10 minutes after the battery charger is first powered up, the charger will automatically switch from tester to charger if a battery is connected. In that case, the charger will be set to the Charging/Maintaining rate and gel cell battery type.

## TESTING AFTER CHARGING

After the unit has been changed from tester to charger (by selecting a charge rate), it remains a charger. To change the battery charger back to a tester, press the RATE SELECTION button until all charge rate LEDs are off.

**NOTE:** The battery tester is only designed to test batteries. Testing a device with a rapidly changing voltage could yield unexpected or inaccurate results.

## USING THE ALTERNATOR PERFORMANCE TESTER

1. With the charger unplugged from the AC outlet, connect the charger to the battery, following the instructions given in previous sections.
2. Plug the charger AC power cord into the AC outlet.
3. Start the vehicle and turn on the vehicle's headlights. Read the voltage on the digital display. If you get a reading between 13.2 volts and 14.6 volts, the alternator is working properly. If the reading is less than 13.2 volts or more than 14.6 volts, have the charging system checked by a qualified technician.

## 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 clipped together, on or around metal, or clipped to the cables.



## TROUBLESHOOTING AND ERROR CODES

### Error Codes

ERROR CODE	DESCRIPTION	REASON/SOLUTION
F01	The battery voltage is still under 10V (for a 12V battery) or 5V (for a 6V battery) after 2 hours of charging.	The battery could be bad. Have it checked or replaced.
F02	The charger cannot desulfate the battery.	The battery could not be desulfated; have it checked or replaced.
F03	The battery was unable to reach the "full charge" voltage.	May be caused by trying to charge a large battery or bank of batteries on too low of a current setting. Try again with a higher current setting or have the battery checked or replaced.
F04	The connections to the battery are reversed.	The battery is connected backwards. Unplug the charger and reverse the connections to the battery.
F05	The charger was unable to keep the battery fully charged in maintain mode.	The battery won't hold a charge. May be 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.
F06	The charger detected that the battery may be getting too hot (thermal runaway).	The charger automatically shuts the current off if it detects the battery may be getting too hot. Have the battery checked or replaced.

If you get an error code, check the connections and settings and/or replace the battery.

### Troubleshooting

PROBLEM	POSSIBLE CAUSE	REASON/SOLUTION
Battery clamps do not spark when touched together.	The charger is equipped with an auto-start feature. It will not supply current to the battery clamps until a battery is properly connected. The clamps will not spark if touched together.	No problem; this is a normal condition.
Three LEDs come on for 2 seconds, then turn off.	The charger is plugged into an AC outlet.	No problem; this is normal.
The charger will not turn on when properly connected.	AC outlet is dead.  Poor electrical connection.  Battery is defective.	Check for open fuse or circuit breaker supplying AC outlet.  Check power cord and extension cord for loose fitting plug.  Have battery checked.

PROBLEM	POSSIBLE CAUSE	REASON/SOLUTION
Short or no start cycle when cranking engine.	<p>Drawing more than the Engine Start Rate.</p> <p>Failure to wait 3 minutes (180 seconds) between cranks.</p> <p>Clamps are not making a good connection.</p> <p>AC cord and/or extension cord is loose.</p> <p>No power at receptacle.</p> <p>The charger may be overheated.</p> <p>Battery may be severely discharged.</p>	<p>Crank time varies with the amount of current drawn. If cranking draws more than the Engine Start Rate, crank time may be less than 3 seconds.</p> <p>Wait 3 minutes of rest time before the next crank, to allow the battery and charger to cool down.</p> <p>Check for poor connection at battery and frame.</p> <p>Check power cord and extension cord for loose fitting plug.</p> <p>Check for open fuse or circuit breaker supplying AC outlet.</p> <p>The thermal protector may have tripped and needs a little longer to close. Make sure the charger vents are not blocked. Wait and try again.</p> <p>On a severely discharged battery, use the 30&lt;&gt;12A Boost setting for few minutes, to help assist in cranking.</p>
I cannot select a 6V or 12V setting.	The charger is equipped with Auto Voltage Detection, which automatically detects the voltage and charges the battery.	No problem; this is normal.

## 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**