

# **Installation Instructions for 81991**

## **Battery Charger & Maintainer**

### **6 Volt / 12 Volt 2-Bank 2 Amp**

**PLEASE SAVE THIS OWNERS MANUAL AND READ BEFORE EACH USE.** This manual will explain how to use the charger safely and effectively. Please read and follow these instructions and precautions carefully.

#### **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.
- 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 the engine.

#### **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 charger for charging only 6 and 12V LEAD-ACID (STD, GEL or AGM) 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.



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### 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.

### 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 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

**WARNING: 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, 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

**WARNING: 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.



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## 8. GROUNDING AND AC POWER CORD CONNECTIONS

**8.1** This battery charger is for use on a nominal 120 volt circuit. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances. The plug pins must fit the receptacle (outlet). Do not use with an ungrounded system.

**8.2 DANGER:** Never alter the AC cord or plug provided – if it does not fit the outlet, have a proper grounded outlet installed by a qualified electrician. An improper connection can result in a risk of an electric shock or electrocution.

**NOTE:** Pursuant to Canadian Regulations, use of an adapter plug is not allowed in Canada. Use of an adapter plug in the United States is not recommended and should not be used.

## 8.3 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	18	18	18	16

\* AWG – American Wire Gauge

## 9. ASSEMBLY INSTRUCTIONS

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

## 10. CONTROL PANEL

### LED INDICATORS

**POWER (green) LED lit:** The charger is connected to AC power.

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

**CHARGED (green) LED lit:** The battery is fully charged and the charger is in maintain mode.

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

**BAD BATTERY/CLAMPS REVERSED (red) LED lit:** The charger has detected a problem with the battery.

See *Troubleshooting* for more information.

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

## 11. OPERATING INSTRUCTIONS

**IMPORTANT:** Do not start the vehicle with the charger connected to the AC outlet, or it may damage the charger and your vehicle.

**NOTE:** This charger is equipped with an auto-start feature. Current is supplied to the battery clamps before a battery is connected, and the clamps may 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. Place the charger on a dry, non-flammable surface, or use the convenient hook attachment to hang the unit safely outside the work area.
5. Lay the AC/DC cables away from any fan blades, belts, pulleys and other moving parts.
6. Connect the battery, following the precautions listed in sections 6 and 7.
7. Connect the charger to a live grounded 120V AC outlet.
8. The green Power LED will light.
9. When charging is complete, disconnect the charger from the AC power, remove the clamp from the vehicle's chassis, and then remove the clamp from the battery terminal.



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## CHARGING A BATTERY OUTSIDE OF THE VEHICLE

1. Place battery in a well-ventilated area.
2. Clean the battery terminals.
3. Connect the battery, following the precautions listed in sections 6 and 7.
4. Connect the charger to a live grounded 120V AC outlet.
5. The green Power LED will light.
6. When charging is complete, disconnect the charger from the AC power, disconnect the negative clamp, and finally the positive clamp.
7. A marine (boat) battery must be removed and charged on shore.

## USING THE QUICK-CONNECT CABLE CONNECTORS

Connect either of the two (2) output cable leads to the charger. Make sure to place the charger on a dry, non-flammable surface.

**WARNING:** Never connect the clamp and ring terminal connectors together for use in other applications, such as external battery or other power source charging, or to extend the output cable length, as reverse polarity and/or overcharge conditions will occur.

## BATTERY CLAMP QUICK-CONNECT

1. Connect the end of the charger output cable to the end of the battery cable quick-connect and clamps.
2. Follow the steps in sections 6 and 7, to connect the output clamps to the battery.
3. Connect the charger to a live 120V AC outlet.

## RING TERMINAL QUICK-CONNECT

1. To permanently attach to a battery, loosen and remove each nut from the bolt at the battery terminal.
2. Connect the red POSITIVE connector ring to the POSITIVE battery terminal.
3. Connect the black NEGATIVE connector ring to the NEGATIVE battery terminal.
4. Replace and tighten the nuts to secure.
5. Connect the cable to the end of the charger output cord. Take care to keep the wires and plug away from metal and moving parts.
6. Connect the charger to a live grounded 120V AC outlet.

## BATTERY CHARGING TIMES

APPLICATION	BATTERY SIZE	CHARGING TIME (Hours)			
		2A	6A	8A	10A
<b>POWERSPORTS</b> ↓	6Ah	6	2	1.75	1.5
	32Ah	15	5	4.5	4
<b>AUTOMOTIVE</b> ↓	300 CCA	12	4	3.5	3
	1000 CCA	30	10	8.5	7
<b>MARINE</b>	50Ah	15	5	4.25	3.5
	105Ah	33	11	9.5	8

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

## AUTOMATIC CHARGING MODE

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

## BAD BATTERY

If charging cannot be completed normally, the charger's output is shut off and the red Bad Battery LED will light. Do not continue attempting to charge this battery. Check the battery and replace, if necessary.



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## **DESULFATION MODE**

If the battery is left discharged for an extended period of time, it could become sulfated and not accept a normal charge. If the charger detects a sulfated battery, the charger will switch to a special mode of operation designed for such batteries. If successful, normal charging will resume after the battery is desulfated. Desulfation could take 8-10 hours. If desulfation fails, the red Bad Battery LED will light.

## **COMPLETION OF CHARGE**

Charge completion is indicated by the green Charged LED. When lit, the charger has switched to the maintain mode of operation.

## **MAINTAIN MODE (FLOAT MODE MONITORING)**

When the green Charged 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 Bad Battery 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 unit maintains both 6 and 12 volt batteries, keeping them at full charge. It is not recommended for industrial applications.

**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 recommended.

## **12. MAINTENANCE AND CARE**

A minimal amount of care can keep your battery charger working properly for years.

**12.1** 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.

**12.2** Occasionally cleaning the case of the charger with a soft cloth will keep the finish shiny and help prevent corrosion.

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

**12.4** Store the charger unplugged from the AC power outlet in an upright position.

**12.5** Store inside, in a cool, dry place. Do not store the clamps clipped together, on or around metal, or clipped to the cables.



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### 13. TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
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.
The green Power LED does not light when charger is properly connected.	AC outlet is dead.  Poor electrical connection.	Check for open fuse or circuit breaker supplying AC outlet.  Check power cord and extension cord for a loose fitting plug.
The red Bad Battery LED is lit.	The battery voltage is still below 10V (for a 12V battery) or 5V (for a 6V battery) after 2 hours of charging. (or) In maintain mode, the output current is more than 1.5A for 12 hours.  Desulfation was unsuccessful.  Lack of progress is detected and battery voltage is below 14.2V (for a 12V battery) or 7.1V (for a 6V battery).  The battery's initial voltage is below 12.2V (for a 12V battery) or 6.1V (for a 6V battery) and the total input is less than 1.5 Ah.  The battery voltage drops to below 12.2V (for a 12V battery) or 6.1V (for a 6V battery) in Maintain Mode.	The battery may be defective. Make sure there are no loads on the battery. If there are, remove them. If there are none, have the battery checked or replaced.  The battery may be defective. Have battery checked or replaced.  The battery may be overheated. If so, allow the battery to cool. The battery may be too large or have a short circuit. Have battery checked or replaced.  The battery capacity is too low, or the battery is too old. Have it checked or replaced.  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.

### 14. BEFORE RETURNING

For RETURNS visit [JEGS.com](http://JEGS.com) or call 1-800-345-4545  
Visit [batterychargers.com](http://batterychargers.com) for Replacement Parts.

### 15. LIMITED WARRANTY

For information on our one year limited warranty, please visit [batterychargers.com](http://batterychargers.com) or call 1-800-621-5485 to request a copy.  
Go to [batterychargers.com](http://batterychargers.com) to register your product online.



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