CONSTANT- MONITORING BATTERY CHARGER *OPERATIONS MANUAL*

Waterproof 800 Battery Tender® Battery Charger 12 Volt 800 mAmp

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS: This manual contains important safety and operating instructions for the Waterproof 800 Battery Tender® Battery Charger. **CAREFULLY READ THESE INSTRUCTIONS BEFORE USING THE BATTERY CHARGER.**

WARNING AND CAUTION LABEL DEFINITIONS:

⚠ WARNING

WARNING indicates a potentially hazardous situation, which, if not avoided, could result in serious injury or death.

⚠ CAUTION

CAUTION indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury.

CAUTION

CAUTION used without the safety alert symbol indicates a potentially hazardous situation that if not avoided, may result in property damage.

GENERAL PRECAUTIONS

⚠ WARNING

Batteries, battery posts, terminals and related accessories contain lead and lead compounds and other chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Always wash your hands after handling these devices.

⚠ WARNING

WORKING WITH LEAD ACID BATTERIES AND BATTERY CHARGERS: Explosive hydrogen gas, which escapes during charging, could cause death or serious injury. Charge battery in a well-ventilated area. Keep open flames, electrical sparks and smoking material away from battery at all times. It is important that you follow the precautions recommended by both the battery and battery charger manufacturers before using either one. KEEP BATTERIES AWAY FROM CHILDREN.

CAUTION

USING MANUALS: Study all of the battery manufacturer's precautions and specific recommendations for safe operation, such as not removing cell caps while charging and the recommended rates of charge (charger output current).

⚠ CAUTION

CHARGER LOCATION: LOCATE the charger as far away from the battery as is allowed by the length of the output cable harness. **NEVER** set the charger above the battery. **NEVER** set the charger on a surface constructed from combustible material.

CHARGER VOLTAGE COMPATIBILITY: NEVER use a battery charger unless the battery voltage matches the output voltage rating of the charger. For example, do not use a 12-volt charger with a 6-volt battery and vice-versa.

EXCESSIVE MOISTURE: Do not expose the charger or the electrical connections at the ends of the AC power cord or the DC output cord and accessories to rain or snow.

CHARGER ATTACHMENTS: Do not use attachments that are not recommended or sold by Harley-Davidson Motor Company. To do otherwise may result in the risk of electric shock, fire, or possibly some other unforeseen potential personal injury situations.

HANDLING POWER CORDS: When handling electric power cords, always pull by the plug rather than by the cord. This will reduce the risk of damage to both the plug and cord, and it will minimize the likelihood of electric shock resulting from that damage.

LOCATION OF POWER CORDS: Make sure all electric power cords are located so that they cannot be stepped on, tripped over, or otherwise subjected to damage or stress.

MONITORING SEALED & NON-SEALED BATTERIES: When leaving a battery charger connected to either a sealed (AGM or GEL) or non-sealed (flooded battery) for extended periods of time (weeks, months, etc.), periodically check the battery to see if it is unusually warm. This is an indication that the battery may have a weak cell and that it could go into a thermal runaway condition. If the battery releases an excessive amount of gas or if the battery gets hotter than 110°F (43°C) during charging, disconnect the charger and allow the battery to cool. Overheating may result in plate distortion, internal shorting, drying out or other damage. For flooded batteries, also check individual cell fluid levels against manufacturer's recommendations for safe operation.

⚠ WARNING

CHARGER MAINTENANCE: NEVER disassemble the charger or attempt to do internal repairs. Take it to a qualified service technician. Assembling the charger incorrectly may result in the risk of electric shock or create a fire hazard.

⚠ WARNING

EXTENSION CORDS: An extension cord should not be used unless absolutely necessary. Using improper extension cord could result in a risk of fire and electric shock. If extension cord must be used, make sure that:

- The pins on the extension cord plug have the same number, size, and shape as those of the AC power cord plug on the charger;
- The extension cord is properly wired and is in good electrical condition; and
- The wire size is as specified in Table 1 below.

TABLE 1: EXTENSION CORD LENGTH & MINIMUM SAFE CONDUCTOR SIZE

Note: The smaller the AWG number, the larger the conductor diameter.

Length of Cord (feet)	6 to 100	101 to150
Length of Cord (meters)	1.8 to 30.5	30.8 to 45.6
Size of Conductor (AWG)	18	16
Conductor Diameter (mm)	1.25	1.5

⚠ WARNING

Do not operate the charger with damaged AC power cords or plugs or DC output cords or accessories - replace them immediately.

PERSONAL PRECAUTIONS

⚠ WARNING

All batteries contain electrolyte. Electrolyte is a sulfuric acid solution that is highly corrosive and can cause severe chemical burns. Avoid contact with skin, eyes, and clothing. Avoid spillage. Always wear approved protective face shield, rubberized gloves, and protective clothing when working with batteries or electrolyte solution. Inadequate safety precautions and work procedures could result in death or serious injury.

WHEN YOU WORK NEAR LEAD-ACID BATTERIES:

1. Someone should be within range of your voice or close enough to come to your aid if you have an accident;
2. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes;
3. Wear complete eye protection and protective clothing. Avoid touching your eyes while working near a battery. If battery acid contacts your skin or clothing, wash immediately with soap and water. If acid enters an eye, immediately flood the eye with running cold water for at least 10 minutes and get medical attention as soon as possible;
4. If battery acid is ingested, drink large quantities of milk or water, followed by milk of magnesia, vegetable oil, or beaten eggs. Call a doctor immediately;
5. Be extra cautious when handling metal tools around a battery. If you drop a metal tool near a battery it might spark or create a short circuit between the battery terminals and some other metal part. Either event may cause a dangerous electrical shock hazard, a fire, or even an explosion;
6. Remove all 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-circuited current high enough to weld a metal ring or other piece of jewelry, causing a severe burn;
7. Use the Waterproof 800 Battery Tender® Battery Charger for charging lead-acid batteries only. It is not intended to supply power to an extra low-voltage electrical system or to charge dry-cell batteries. Charging dry-cell batteries may cause them to burst and cause injury to persons and damage to property;

INFORMATION NOTE ABOUT DRY-CELL BATTERIES:

There are some wet, non-spillable, lead acid batteries on the market whose manufacturers' make the claim that they are dry-cell batteries. These batteries are sealed, gas-recombinant, starved electrolyte, possibly with AGM (Absorbed Glass Mat) type construction. It is perfectly safe to use the Waterproof 800 Battery Tender® Battery Charger to charge these types of batteries. The dry-cell battery warning is intended for alkaline and other similar batteries, both rechargeable and non-rechargeable types. If you have any doubt about the type of battery that you have, please contact the battery manufacturer before attempting to charge the battery.

8. **NEVER** charge a visibly damaged or frozen battery.

PREPARING TO CHARGE: First, follow all General & Personal Precautions as previously explained, and then continue.

⚠ WARNING

Unplug or turn off battery charger before connecting charger cables to battery. Connecting cables with charger ON can cause a spark and battery explosion, which could result in death or serious injury.

⚠ WARNING

IF THE BATTERY MUST BE REMOVED FROM THE VEHICLE:

1. Refer to vehicle owner's manual for proper battery disconnection and removal precautions and instructions. Inadequate safety precautions could result in death or serious injury;
2. To avoid an electric arc (or spark), turn off or disconnect the ignition and all of the accessories in the vehicle. Then always remove the cable that is connected to grounded terminal from battery first;
3. If necessary, clean the battery terminals. Be careful to keep the corrosion and other debris from coming in contact with your eyes;
4. Add distilled water to each cell until the battery acid solution reaches the level specified by battery manufacturer. Do not overfill;
5. Before inserting the charger AC power plug into the electrical outlet, check the polarity of the battery posts, and attach at least a 24-inch long 6 (AWG) insulated, battery extension cable to the negative battery post. Then connect the appropriate charger DC output connectors to the battery and the extension cable, positive-to-positive and negative-to-negative. Never allow the alligator clips or terminal rings to touch each other after they are connected to the battery charger;
6. Step away from the battery and connect the AC power plug to the electrical outlet.

⚠ WARNING

IF THE BATTERY REMAINS INSTALLED IN THE VEHICLE:

1. DO NOT CONNECT THE CHARGER AC POWER PLUG TO THE ELECTRICAL OUTLET UNTIL ALL OTHER CONNECTIONS ARE MADE! Be sure that the ignition and all electrical accessories are turned off;
2. Place both the AC and DC power cords in the best position to avoid accidental damage by movable vehicle parts;
3. Check the polarity of the battery posts. If the positive (pos, p, +) post is connected to the vehicle chassis, then the vehicle has a positive ground system. If the negative (neg, n, -) post is connected to the vehicle chassis, then the vehicle has a negative ground system. Negative ground systems are the most common;

CAUTION

Do not reverse the charger connections described in the following steps or the charging system of the motorcycle could be damaged.

4. For negative ground systems, connect the positive (red) alligator clip, or ring terminal to the positive battery post. Then connect the negative (black) alligator clip, or ring terminal to the vehicle chassis. Do not make the negative charger clip or ring connection to the carburetor, fuel lines, or thin, sheet metal parts. Make that connection to the engine block or a heavy gauge metal part of the frame;
5. For positive ground systems, connect the negative (black) alligator clip, or ring terminal to the negative battery post. Then connect the positive (red) alligator clip, or ring terminal to the vehicle chassis. Do not make the positive charger clip or ring connection to the carburetor, fuel lines, or thin, sheet metal parts. Make that connection to the engine block or a heavy gauge metal part of the frame;
6. Step away from the battery and connect the AC power plug to the electrical outlet.

USER INSTRUCTIONS

AUTOMATIC CHARGING AND BATTERY STATUS MONITORING: Battery Tender® 800 chargers are completely automatic and may be left connected to both AC power and to the battery that it is charging for long periods of time. The charger output power, voltage, and current depends on the condition of the battery it is charging. The Battery Tender® 800 charger has a two-color LED indicator light that provides a visual means to determine the operating mode of the charger and hence the condition of the battery connected to the charger.

The two-colored status indicator LED light is available to determine whether the charger is operating in one of the 4 primary charge modes: **Qualification/Initialization mode:** The Monitor Circuit verifies appropriate battery voltage levels and good electrical continuity between the battery and the charger DC output. The **bulk mode** (full charge, constant current, battery is 0% to 80% charged), the **absorption mode** (high constant voltage, battery is 80% to 100% charged), or the **storage/float maintenance mode** (low constant voltage, battery is 100% to 103% charged).

When the battery is fully charged, the LED will turn green and the charger will switch to a storage/maintenance charge mode. The Battery Tender® 800 charger will automatically monitor and maintain the battery at full charge.

NOTE:

THE OUTPUT CLIPS OR RING TERMINALS MUST BE CONNECTED TO A BATTERY BEFORE THE CHARGER CAN PRODUCE AN OUTPUT VOLTAGE.

SPECIAL FEATURES: The Waterproof 800 Battery Tender® Battery Charger has the following special features:

SPARKPROOF: The battery charger DC output leads, either ring terminals or alligator clips must be connected to a battery before an output voltage is developed by the battery charger.

SHORT CIRCUIT PROTECTION: The battery charger can sustain a short circuit connection directly across its DC output terminals indefinitely without any risk of either electric shock or excessive heat.

REVERSE POLARITY PROTECTION: Neither the battery charger nor the battery will be damaged if the charger DC output leads are connected to the opposite polarity battery post.

HARNESS CONNECTIONS for 2 or 3 PIN ACCESSORIES:

The Waterproof 800 Battery Tender® Battery Charger has a 2-wire DC output cable. The end of this cable has a 2-pin quick disconnect type connector. Pictorial examples are shown on both the left and right sides of Figure 1 below. The connectors are identical in both their physical appearance and mechanical construction. However, the Electrical Potential of the Exposed Metal Pin is high (up to approx 15 volts) on the charger cable connector and low (nearly ground or zero volts) on the harness cable connector. The opposite is true for the covered metal socket in each connector.

HARNESS CONNECTION:

Connecting to a two-pin harness

1. Refer to Figure 1. Connect the two-pin connector from the battery charger (left side) straight on to the two-pin connector on the battery harness (right side).

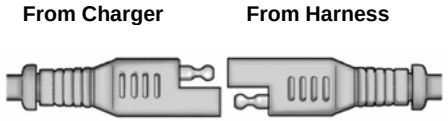

Figure 1

Connecting to a three-pin harness

1. Refer to Figure 2. Connect the two-pin connector from the battery charger (left hand) to the three-pin connector from the battery harness (right hand).

Note: The electrical potential of the exposed pin on the 3-pin harness connector is low (nearly ground, or zero volts), just as it is on the 2-pin harness connector.

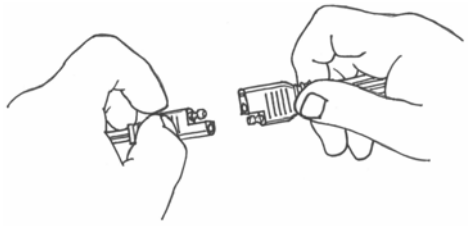

Figure 2

TIME REQUIRED TO CHARGE A BATTERY:

The Waterproof 800 Battery Tender® Battery Charger has a nominal DC output of 12 volts and 800 mAmps. It charges at a rate of 800 mAmps (0.800 Amp-Hours per hour). Therefore, a fully discharged 15 Amp-hour battery will take approximately 15 hours to recharge to 80% capacity. A typical motorcycle engine start battery has a capacity of between 25 and 40 Amp-hours. So the recharge times from a fully discharged state can be quite long.

NOTE: Some large automotive or marine, deep cycle type batteries may take up to several days to fully recharge.

WORKING WITH A DEAD BATTERY OR A BATTERY WITH A VERY LOW VOLTAGE:

If you try to charge a dead battery having a voltage below 3 Volts, the Waterproof 800 Battery Tender® Battery Charger will not start to charge because an internal safety circuit prevents the battery chargers from generating any DC output voltage.

NOTE:

If a 12 Volt, Lead-Acid battery has an output voltage of less than 9 volts when it is at rest, when it is neither being charged nor supplying electrical current to an external load, there is a good chance that the battery is defective. As a frame of reference, a fully charged 12-Volt, Lead-Acid battery will have a rest-state, no-load voltage of approximately 12.9 volts. A fully discharged 12-Volt, Lead-Acid battery will have a rest-state, no-load voltage of approximately 11.4 volts. That means that a voltage change of only 1.5 volts represents the full range of charge 0% to 100% on a 12-Volt, Lead-Acid battery. Depending on the manufacturer, and the age of the battery, the specific voltages will vary by a few tenths of a volt, but the 1.5-volt range will still be a good indicator of the battery charge %.

STATUS INDICATING LIGHT: If the light is not lit, then the battery is not properly connected and/or the charger is not plugged into AC power. The following describes light operation:

- **AMBER LIGHT FLASHING** – The AMBER light flashing indicates that the battery charger has AC power available and that the microprocessor is functioning properly. If the AMBER light continues to flash, then either the battery voltage is too low (less than 3 volts) or the output alligator clips or ring terminals are not connected correctly. The fuse in the output alligator clips or ring terminals may also be blown.
- **AMBER LIGHT ON STEADY** – Whenever the AMBER light is on steady, a battery is connected properly and the charger is charging the battery. The AMBER light will remain on until the charger completes the charging stage.
- **GREEN LIGHT FLASHING** –When the green light is flashing, the battery is greater than 80% charged and may be removed from the charger and used if necessary. Whenever possible, leave the battery on charge until the green light is solid.
- **GREEN LIGHT ON STEADY** –When the green light burns steady, the charge is complete and the battery can be returned to service if necessary. It can also stay connected to maintain the battery for an indefinite period of time

STATUS INDICATING SYMBOLS: The following symbols are located next to the status indicator light.

The symbol on the left side of the indicator light represents a partially charged battery. The solid band across the bottom is green in color. The background is yellow. The green area indicates the charged portion of the battery and the yellow area represents the uncharged portion. The symbol on the right side of the indicator light represents a fully charged battery. The entire area inside the battery outline is green.

TROUBLESHOOTING CHECK LIST:

1. **THE CHARGER GREEN LIGHT GOES ON IMMEDIATELY WHEN AC POWER IS APPLIED TO THE CHARGER:** The charger connections at the battery may be intermittent, the battery may be defective, or the battery might already be fully charged.

2. **CHARGER IS CHARGING BUT THE GREEN LIGHT DOES NOT TURN ON IN A REASONABLE AMOUNT OF TIME:** The battery may be large and requires more time to fully charge than originally expected, there may be another appliance drawing electric power from the battery while it is charging, or the battery may be defective. Also, a newly purchased battery may not be fully charged and may take longer to charge initially.

3. **THE AMBER LIGHT COMES AGAIN AFTER THE GREEN LIGHT CAME ON.** There may be another appliance drawing electric power from the battery causing its voltage to drop below the reset level. The battery charger then goes back into full charge mode. Also, the charger connections at the battery may be intermittent or the battery may be defective.

Technical Specifications

Input & Output Characteristics		**Waterproof 800 Battery Tender® Battery Charger**
AC Input Voltage / Frequency		100 to 240 VAC, 50/60 Hz
AC Input Current (Max)	@ 100VAC	0.275 Amps
	@ 240VAC	0.115 Amps
DC Output Current		800 mAmp
DC Output Voltage		12 Volts

Specific Charger Output Voltage Amplitudes throughout the entire charge algorithm, including absorption and float maintenance, are consistent with Harley-Davidson optimum charging recommendations.

Operating Temperature	-20 °C to +50 °C
Enclosure Protection Against Foreign Object & Water Ingress	IP67

Charger Case Dimensions:
4.25 in (108 mm) L **x** 2.75 in (70 mm) W **x** 1.375 in (35 mm) H.
Note: Allow an additional clearance (2.0 inches, 50.8 mm, typical) to the length dimension for safe bend of AC and DC power cord strain relief.

Shipping Bill Weight (Rounded Up to Nearest lb.): Approx. 2.0 lbs (0.9 kg)	WITH:Accessories & Retail Packaging

Acceptable Battery Cell Type, Number, and Ah Capacity

Charger Model	Cell Type	Number	Ah Capacity
12V, 800 mAmp	Lead Acid	6 Cells	Up to 60 Ah

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