

Deltran Battery Tender®

12V 5Amp and 24V 2.5Amp Selectable Charger

For 12V Four Cell Lithium (LiFePO4) Batteries, 24V Eight Cell Lithium (LiFePO4) Batteries, 12V Six cell and 24V Twelve Cell Lead-Acid/AGM Batteries



IMPORTANT SAFETY INSTRUCTIONS

- 1) SAVE THESE INSTRUCTIONS – This manual contains important safety and operating instructions for battery charger model P/N 022-0258
- 2) Do not expose charger to rain or snow.
- 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.
- 4) To reduce risk of damage to electric plug and cord, pull by plug rather than cord when disconnecting charger.
- 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:
 - a) That pins on plug of extension cord are the same number, size, and shape as those of plug on charger;
 - b) That extension cord is properly wired and in good electrical condition; and
 - c) That wire size is large enough for ac ampere rating of charger as specified in Table 1

TABLE 1

Length of Cord, Feet	25	50	100	150
AWG Size of Cord	18	18	18	16

- 6) Do not operate charger with damaged cord or plug – replace the cord or plug immediately.
- 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.
- 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.
- 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.
- 10) **WARNING – RISK OF EXPLOSIVE GASES.**
 - a) WORKING IN VICINITY OF A 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.

P/N 392-0390-R0

11) PERSONAL PRECAUTIONS

- a) Consider having someone close enough by to come to your aid when you work near a battery.
- b) Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
- c) Wear complete eye protection and clothing protection. Avoid touching eyes while working near battery.
- d) 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.
- e) NEVER smoke or allow a spark or flame in vicinity of battery or engine.
- f) 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.
- g) Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a battery. A battery can produce a short-circuit current high enough to weld a ring or the like to metal, causing a severe burn.
- h) Use charger for charging **Lead-Acid/AGM/Lithium (LiFePO4)** batteries only. It is not intended to supply power to a low voltage electrical system. Do not use battery charger for charging non-rechargeable batteries that are commonly used with home appliances. These batteries may burst and cause injury to persons and damage to property.
- i) NEVER charge a frozen battery.

12) PREPARING TO CHARGE

- a) 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.
- b) Be sure area around battery is well ventilated while battery is being charged.
- c) Clean battery terminals. Be careful to keep corrosion from coming in contact with eyes.
- d) 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.
- e) Study all battery manufacturers specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.
- f) Determine voltage of battery by referring to car owner's manual and make sure that output voltage selector switch is set at correct voltage. Do not use the battery charger unless battery voltage matches the output voltage rating of the charger.

13) CHARGER LOCATION

- a) Locate charger as far away from battery as dc cables permit.
- b) Never place charger directly above battery being charged; gases from battery will corrode and damage charger.
- c) Never allow battery acid to drip on charger when reading electrolyte specific gravity or filling battery.
- d) Do not operate charger in a closed-in area or restrict ventilation in any way.
- e) Do not set a battery on top of charger.

14) DC CONNECTION PRECAUTIONS

- a) 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.
- b) Attach clips to battery and chassis as indicated in 15(e), 15(f), and 16(b) through 16(d).

15) FOLLOW THESE STEPS WHEN BATTERY IS INSTALLED IN VEHICLE. A SPARK NEAR BATTERY MAY CAUSE BATTERY EXPLOSION. TO REDUCE RISK OF A SPARK NEAR BATTERY:

- a) Position ac and dc cords to reduce risk of damage by hood, door, or moving engine part.
- b) Stay clear of fan blades, belts, pulleys, and other parts that can cause injury to persons.
- c) Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has larger diameter than NEGATIVE (NEG, N, -) post.
- d) Determine which post of battery is grounded (connected) to the chassis. If negative post is grounded to chassis (as in most vehicles), see (e). If positive post is grounded to the chassis, see (f).
- e) For negative-grounded vehicle, connect POSITIVE (RED) clip from battery charger to POSITIVE (POS, P, +) ungrounded post of battery first. Then 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.
- f) For positive-grounded vehicle, connect NEGATIVE (BLACK) clip from battery charger to NEGATIVE (NEG, N, -) ungrounded post of battery first. Then 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;
- g) Connect charger AC supply cord to electric outlet; and
- h) When disconnecting charger, turn switches to off, disconnect AC cord, remove clip from vehicle chassis, and then remove clip from battery terminal.
- i) See operating instructions for length of charge information.

16) FOLLOW THESE STEPS WHEN BATTERY IS OUTSIDE VEHICLE. A SPARK NEAR THE BATTERY MAY CAUSE BATTERY EXPLOSION. TO REDUCE RISK OF A SPARK NEAR BATTERY:

- a) Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has a larger diameter than NEGATIVE (NEG, N, -) post.
- b) Attach at least a 24-inch-long 6-gauge (AWG) insulated battery cable to NEGATIVE (NEG, N, -) battery post.
- c) Connect POSITIVE (RED) charger clip to POSITIVE (POS, P, +) post of battery.
- d) 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.
- e) Do not face battery when making final connection.
- f) When disconnecting charger, always do so in reverse sequence of connecting procedure and break first connection while as far away from battery as practical.
- g) A marine (boat) battery must be removed and charged on shore. To charge it on board requires equipment specially designed for marine use.

GROUNDING AND AC POWER CORD CONNECTION INSTRUCTIONS –

Charger should be grounded to reduce risk of electric shock. Charger is equipped with an electric cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.

DANGER – Never alter AC cord or plug provided – if it will not fit outlet, have proper outlet installed by a qualified electrician. Improper connection can result in a risk of an electric shock.

This battery charger is for use on a nominal 120-volt circuit, and has a grounding plug that looks like the plug illustrated in sketch A in Figure 1. A temporary adapter, which looks like the adapter illustrated in sketches B and C, may be used to connect this plug to a two-pole receptacle as shown in sketch B if a properly grounded outlet is not available. The temporary adapter should be used only until a properly grounded outlet can be installed by a qualified electrician.

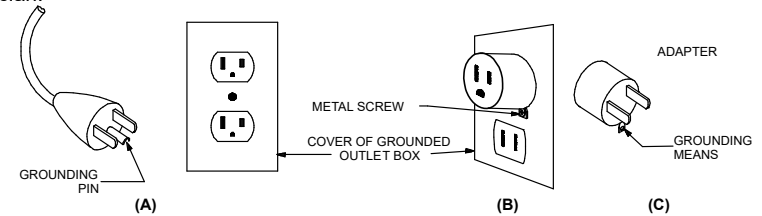


Figure 1

DANGER – Before using adapter as illustrated, be certain that center screw of outlet plate is grounded. The green-colored rigid ear or lug extending from adapter must be connected to a properly grounded outlet– make certain it is grounded. If necessary, replace original outlet cover plate screw with a longer screw that will secure adapter ear or lug to outlet cover plate and make ground connection to grounded outlet.

NOTE:

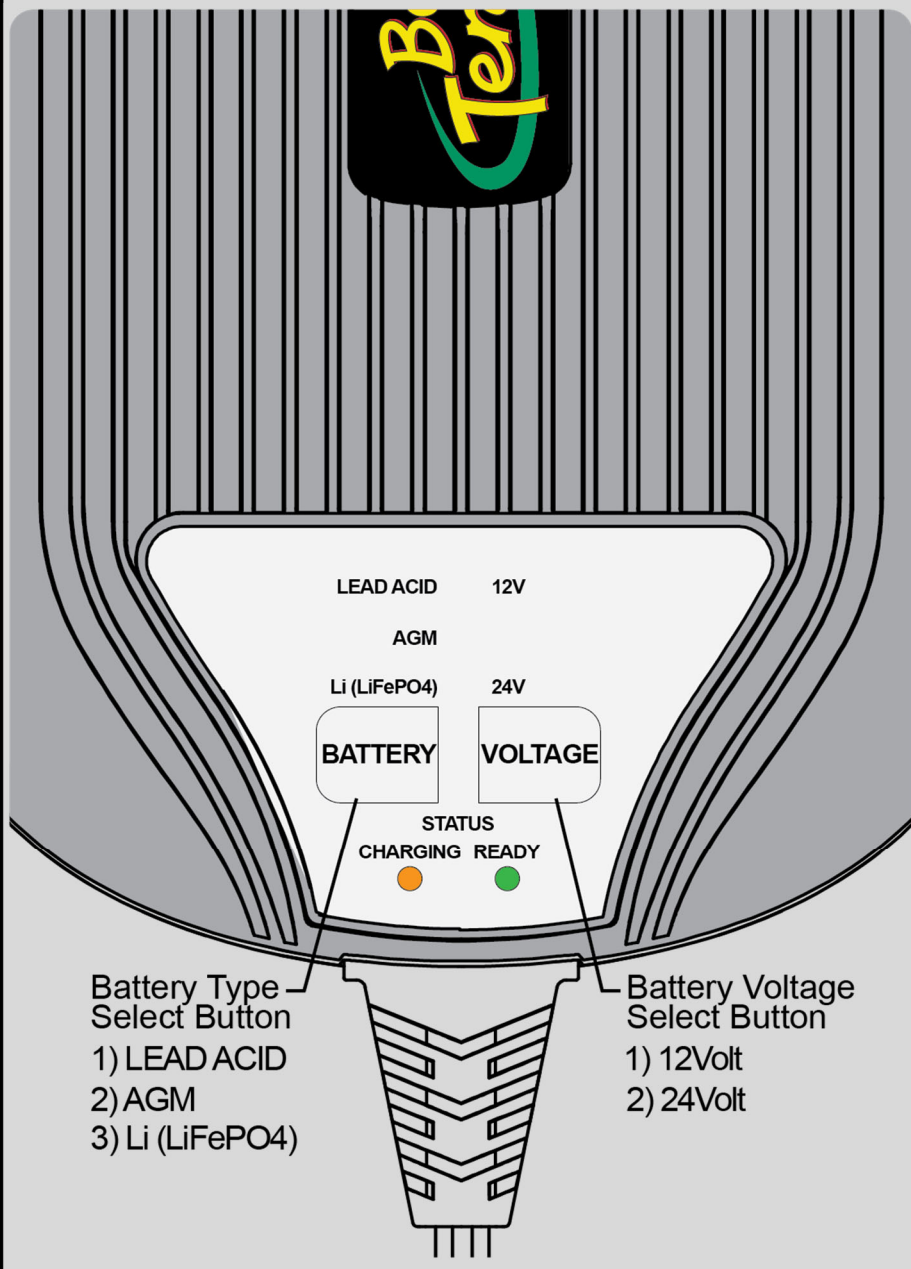
USE OF AN ADAPTER IS NOT ALLOWED IN CANADA. IF A GROUNDING TYPE RECEPTACLE IS NOT AVAILABLE, DO NOT USE THIS APPLIANCE UNTIL THE PROPER OUTLET IS INSTALLED BY A QUALIFIED ELECTRICIAN



■ This symbol indicates separate collection for electrical and electronic equipment

USER INSTRUCTIONS

- Battery Charger Controls/Features



- Battery Voltage Selection Button:
Change the Battery voltage from 12Volts to 24Volts by simply pressing the "VOLTAGE" button. **The battery voltage can be selected once the charger has AC power applied and before the charger is connected to the battery.**

Once the charger has AC power and is also connected to the battery the voltage (12V or 24V) selection cannot be changed. To change the mode, disconnect the battery from the charger.

If the AC power is interrupted the charger will resume charging at the last battery voltage setting used.

The charger can also detect if the incorrect battery voltage has been selected or if the battery is defective once the connection has been made to the battery. The **12V** or **24V** symbol will flash preventing the charge cycle from starting. In order to begin a new charge cycle, reset the charger by disconnecting it from the AC supply as well as the wrong or defective battery for 7-10 seconds. Reconnect the AC supply and the charger will be ready for a new charge cycle.

- Battery Type/Chemistry Selection Button:
Change the battery Type/chemistry from "LEAD ACID" to "AGM", to Li (LiFePO4) by simply pressing the "BATTERY" button.

The battery type must be selected once the charger has AC power applied and before the charger is connected to the battery.

Once the charger has AC power and is also connected to the battery the battery type selection cannot be changed. In order to begin a new charge cycle, reset the charger by disconnecting it from the AC supply as well as the wrong or defective battery for 7-10 seconds. Reconnect the AC supply and the charger will be ready for a new charge cycle.

If the AC power is interrupted the charger will resume charging at the last settings used.

- Automatic Lithium Iron Phosphate (LiFePO4) Recovery Mode

If you try to charge a dead 12 or 24 Volt Lithium Iron Phosphate battery (LiFePO4) with a very low voltage, 6 to 9 Volts (12V), or 12 to 16 Volts (24V) the charger will automatically switch into the Recovery Mode. When in this mode the **Amber CHARGING LED** will be solid and the **Li (LiFePO4)** symbol will flash. If successful and once complete the charger will automatically switch back to the normal charge cycle. There is a three (3) hour time limit for this recovery process. If not successful the **12V** or **24V** symbol will start flashing. It will continue this sequence until the charger is disconnected from the AC source. If this happens there is a good chance that the battery has already been damaged due to the low voltage and cannot be recovered.

- **AUTOMATIC CHARGING AND BATTERY STATUS**

MONITORING: Battery Tender® 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. Battery Tender® chargers have several **STATUS** LED indicators that provide a visual means to determine the operating mode of the charger and hence the condition of the battery connected to the charger.

When AC power is first applied to the charger all of the LED's will illuminate for two to three seconds before starting the charge sequence listed below once connected to a battery.

The two battery level **STATES** LED indicator lights are available to determine whether the charger is operating in one of the four primary charge modes:

- 1) **Qualification/Initialization mode:** The Monitor Circuit verifies appropriate battery voltage levels and good electrical continuity between the battery and the charger DC output.
- 2) **Bulk mode** (full charge, constant current, battery is 0% to 80% charged)
- 3) **Absorption mode** (high constant voltage, battery is 80% to 100% charged).
- 4) **Storage/float maintenance mode** (low constant voltage, battery is 100% to 103% charged).

When the battery is fully charged, the battery level status (READY) Green LED indicator will turn solid green and the charger will switch to a storage/float maintenance charge mode. The Battery Tender® charger will automatically monitor and maintain the battery at full charge

- **ATTENTION: The Battery Tender® CHARGER HAS A SPARK FREE CIRCUITRY.** The output alligator clips or ring terminals will not spark when they are touched together. The Battery Tender® charger will not produce an output voltage until it senses at least 2 volts from a Lead Acid/AGM battery or 6 volts from a LiFePO4 battery. It must be connected to a battery with the correct polarity before it will start charging a battery. Therefore, if you plug the AC power cord into an AC power outlet, and if the output alligator clips or ring terminals are not connected to a battery, and if you touch the alligator clips or ring terminals together, there will be no electrical spark.

NOTE:

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

- **TIME REQUIRED TO CHARGE A BATTERY:**

This Battery Tender® charges at a rate of 5.0 Amps or 2.5 Amp-hours per hour. Therefore at 5.0 Amps a fully discharged 12V, 40 Amp-Hour battery will take approximately 6½ hours to recharge to 80% capacity.

- **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 2 volts, the Battery Tender® charger will not start. An internal safety circuit prevents the charger from generating any output voltage unless it senses at least 2 volts at the charger output. In this situation, the CHARGING amber LED will continue to flash, indicating that a charge has not been initiated.

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 %.

- **LED STATUS INDICATING LIGHTS: If the Amber 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** (Amber) – The amber (CHARGING) LED flashing indicates that the battery charger has AC power available and that the microprocessor is functioning properly. If the amber LED continues to flash, then either the battery voltage is too low (less than 2 volts in the battery) or the output alligator clips or ring terminals are not connected correctly.

< **ALTERNATING GREEN/AMBER** (Amber LED & Green LED) This indicates Reverse polarity connection to the battery.

< The chargers safety timer has activated due the battery not reaching its optimal voltage. The battery may be defective, take the battery to the dealer to be tested.

< **AMBER LIGHT ON STEADY** (Amber LED) – Whenever the amber (CHARGING) LED is on steady, a battery is connected properly and the charger is charging the battery. The amber LED will remain on until the charger completes the charging stage.

< **GREEN LIGHT FLASHING** (Green LED) – When the green (READY) LED is flashing and the amber (CHARGING) LED is solid 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** (Green LED) – When the green (READY) LED 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.

- **Troubleshoot Guide:**

- 1) If the charger does not turn on and none of the LED's illuminate.
 - a. Check to make sure the AC outlet is supplying power by plugging in a lamp, an appliance, or a voltage meter.
- 2) The green READY LED comes on immediately when charging a discharged battery.
 - a. The battery is probably defective, take the battery to the dealer to be tested.
- 3) When charging a battery the green READY LED never comes on.
 - a. The battery may be defective, take the battery to the dealer to be tested.
 - b. The battery has an excessive current draw, remove or disconnect the battery from the equipment.
- 4) The amber LED continues to flash even with a connection to the battery:
 - a. Check the fuse in the accessory cable.
 - b. The battery voltage is too low.
- 5) 12V symbol is flashing.
 - a. The battery is damaged or the incorrect battery voltage has been selected.
- 6) 24V symbol is flashing.
 - a. The battery is damaged or the incorrect battery voltage has been selected.
- 7) Amber & Green LED's are toggling.
 - a. Reverse polarity connection to the battery.
 - b. The chargers safety timer has activated due the battery not reaching its optimal voltage. The battery may be defective, take the battery to the dealer to be tested.

• **Battery Charger Radio Frequency Warnings:**

FCC WARNING

Title 47 Subpart, 15.105(b)

Note: This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio television reception, which can be determined by tuning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help

Canadian ICES-001: Industrial, Scientific, and Medical (ISM) Radio Frequency Generators

This product has been tested with the listed standards and found to be compliant with the Code of Industry Canada ES-001 and the measurement Procedure according to CISPR 11.

CAN ICES-1/NMB-1

• **Warranty:**

**This product is covered by a
2 Year general limited warranty**

DISTRIBUTED BY:
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Battery Tender® Deltran Chargeur à selection

12 volts 5 ampères et 24 volts 2,5 ampères

Pour les batteries au lithium à quatre cellules (LiFePO4) de 12 volts, batteries au lithium à huit cellules (LiFePO4) de 24 volts.

Batteries AGM/Plomb-acide à six cellules de 12 volts et Plomb-acide/AGM à douze cellules de 24 volts

**INSTRUCTIONS IMPORTANTES CONCERNANT LA
SÉCURITÉ
CONSERVER CES INSTRUCTIONS. CE MANUEL
CONTIENT DES INSTRUCTIONS IMPORTANTES
CONCERNANT LA SÉCURITÉ ET LE
FONCTIONNEMENT.**

- 1) IL EST DANGEREUX DE TRAVAILLER A PROXIMITÉ D'UNE BATTERIE AU PLOMB. LES BATTERIES PRODUISENT DES GAZ EXPLOSIFS EN SERVICE NORMAL. IL EST AUSSI IMPORTANT DE TOUJOURS RELIRE LES INSTRUCTIONS AVANT D'UTILISER LE CHARGEUR ET DE LES SUIVRE À LA LETTRE.
- 2) POUR RÉDUIRE LE RISQUE D'EXPLOSION, LIRE CES INSTRUCTIONS ET CELLES QUI FIGURENT SUR LA BATTERIE.
- 3) NE JAMAIS FUMER PRÈS DE LA BATTERIE OU DU MOTEUR ET ÉVITER TOUTE ÉTINCELLE OU FLAMME NUE À PROXIMITÉ DE CES DERNIERS.
- 4) UTILISER CHARGEUR POUR RECHARGER UN PLOMB ACIDE OU AU LITHIUM (LiFePO4) BATTERIE UNIQUEMENT. CE CHARGEUR N'EST PAS CONÇU POUR ALIMENTER UN RÉSEAU ÉLECTRIQUE TRÈS BASSE TENSION NI POUR CHARGER DES PILES SÈCHES. LE FAIT D'UTILISER LE CHARGEUR POUR CHARGER DES PILES SÈCHES POURRAIT ENTRAÎNER L'ÉCLATEMENT DES PILES ET CAUSER DES BLESSURES OU DES DOMMAGES;
- 5) NE JAMAIS CHARGER UNE BATTERIE GELÉE.
- 6) S'IL EST NÉCESSAIRE DE RETIRER LA BATTERIE DU VÉHICULE POUR LA CHARGER, TOUJOURS DÉBRANCHER LA BORNE DE MISE À LA MASSE EN PREMIER. S'ASSURER QUE LE COURANT AUX ACCESSOIRES DU VÉHICULE EST COUPÉ AFIN D'ÉVITER LA FORMATION D'UN ARC.
- 7) PRENDRE CONNAISSANCE DES MESURES DE PRÉCAUTION SPÉCIFIÉES PAR LE FABRICANT DE LA BATTERIE, P. EX., VÉRIFIER S'IL FAUT ENLEVER LES BOUCHONS DES CELLULES LORS DU CHARGEMENT DE LA BATTERIE, ET LES TAUX DE CHARGEMENT RECOMMANDÉS.