



Deltran



Deltona Transformer Corporation

12V / 12V Heavy Duty Charger Dual Independent Outputs: 20 Amps each!

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS: This manual contains important safety and operating instructions for the BATTERY TENDER® HEAVY DUTY PORTABLE 12V-12V DUAL 20 AMP 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

Battery posts, terminals and related accessories contain lead and lead components, 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

Do not operate the battery charger with damaged AC power cords or plugs or DC output cords or accessories - Replace accessories immediately. If either the AC power cord or the DC output cords are damaged the battery charger should be sent back to the factory for repair.

CAUTION

WORKING WITH LEAD ACID BATTERIES AND BATTERY CHARGERS: All lead acid batteries have the potential to emit gasses that may combine into a combustible or explosive mixture. In many cases, it is possible that lead acid batteries will emit these gasses during normal discharge and charging operations. Because of this potential danger, it is important that you follow the precautions recommended by both the battery and battery charger manufacturers before using either one.

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 VOLTAGE COMPATIBILITY: **NEVER** use a battery charger unless the battery voltage matches the output voltage rating of the charger. Do not use a 12-volt charger with a 6-volt battery and vice-versa.

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. **NEVER** place the battery, the charger, or any of the electrical connections between them in an area that is likely to become wet.

EXCESSIVE MOISTURE: Do not expose the battery charger or any of its electrical connections (either AC or DC) to rain, snow, or extremely high, condensing humidity.

CHARGER ATTACHMENTS: Do not use attachments that are not recommended or sold by the charger manufacturer. 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 130°F (55°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

ELECTRIC SPARK & OPEN FLAME: NEVER smoke or allow a source of electric spark or open flame in the vicinity of the battery or engine. (For example: Don't charge the battery next to a gas water heater.)

VENTILATION: Do not operate the charger where ventilation is restricted. The intent here is to allow sufficient airflow to minimize and dissipate the heat generated by the charger and to diffuse the gasses that may be emitted by the battery.

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; &
- The wire size is as specified in Table 1 below.

TABLE 1: EXTENSION CORD LENGTH & MINIMUM SAFE CONDUCTOR SIZE		
<i>Note: The smaller the AWG number, the larger the conductor diameter.</i>		
Length of Cord (feet)	6 to 99	100 to 150
Length of Cord (meters)	2 to 30	30 to 46
Size of Conductor (AWG)	12	10
Conductor Diameter (in / mm)	0.093 / 2.36	0.117 / 2.97

PERSONAL PRECAUTIONS

⚠ WARNING

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. 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;

5. 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;
6. Use the BATTERY TENDER® HEAVY DUTY 12V-12V DUAL 20 AMP 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 BATTERY TENDER® HEAVY DUTY 12V-12V DUAL 20 AMP CHARGER to charge these types of batteries. The dry-cell battery warning is intended for non-rechargeable, alkaline and other similar types of batteries. If you have any doubt about the type of battery that you have, please contact the battery manufacturer before attempting to charge the battery.

7. NEVER charge a visibly damaged or frozen battery.

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

⚠ WARNING

IF THE BATTERY MUST BE REMOVED FROM THE VEHICLE:

1. To avoid an electric arc (or spark), turn off or disconnect all of the accessories in the vehicle. Then always remove the cable that is connected to grounded terminal from battery first;
2. If necessary, clean the battery terminals. Be careful to keep the corrosion and other debris from coming in contact with your eyes;
3. If the battery is not a sealed battery, then if necessary, add distilled water to each cell until the battery acid solution reaches the level specified by battery manufacturer. Do not overfill;
4. Check the polarity of the battery posts.
5. Connect the AC power plug to the 120 VAC electrical service outlet. Then follow the normal start up procedures for the BATTERY TENDER® HEAVY DUTY 12V-12V DUAL 20 AMP CHARGER.

⚠ WARNING

IF THE BATTERY REMAINS INSTALLED IN THE VEHICLE:

1. Place both the AC and DC power cords in the best position to avoid accidental damage by movable vehicle parts, i.e. hoods, doors, or moving engine parts (fan blades, belts, or pulleys).
2. 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.

3. Connect the AC power plug to the 120 VAC electrical service outlet. Then follow the normal start up procedures for the BATTERY TENDER® HEAVY DUTY 12V-12V DUAL 20 AMP CHARGER.

⚠ WARNING

POSITIVE & NEGATIVE VEHICLE GROUND SYSTEMS:

1. If the positive (pos, p, +) battery post is connected to the vehicle chassis, then the vehicle has a positive ground system. If the negative (neg, n, -) battery post is connected to the vehicle chassis, then the vehicle has a negative ground system. Negative ground systems are the most common.
2. **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 to the negative battery post. You may also connect the negative (black) alligator clip to the vehicle chassis, but **DO NOT** make the negative charger alligator clip 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.
3. **For positive ground systems**, connect the negative (black) alligator clip to the negative battery post. Then connect the positive (red) alligator clip to the positive battery post. If you prefer, you may also connect the positive (red) alligator clip to the vehicle chassis, but **DO NOT** make the positive (red) charger alligator clip 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. 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.

⚠ WARNING
USING
UNGROUNDED
AC 120 VAC
SERVICE
OUTLETS:

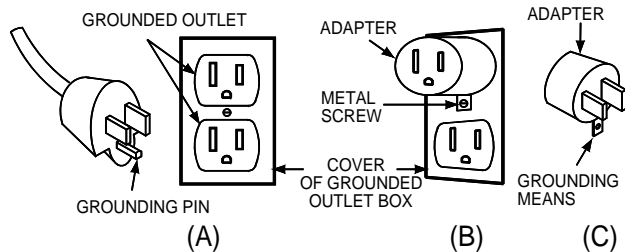


Figure 2

1. **FOR USE ONLY IN THE UNITED STATES**, THE USE OF A 3 TO 2 PRONG GROUND ADAPTER PLUG IS NOT ALLOWED IN CANADA. Your battery charger is designed for use on a nominal 120-volt circuit. It comes equipped with a grounding plug that looks like the one illustrated in Figure 2A. A temporary adaptor (Figure 2C), may be used to connect this plug to a two-pole receptacle as shown in Figure 2B if a properly grounded outlet is not available. The temporary adaptor should be used only until a properly grounded outlet can be installed by a qualified electrician.
2. **DANGER** - Before using the adapter as illustrated, be certain that the center screw of outlet plate is grounded. The green-colored rigid ear or lug extending from the adapter must be connected to a properly grounded

outlet - make certain that it is grounded. If necessary, replace original outlet cover plate with a longer screw that will secure adapter ear or lug to outlet cover plate and make ground connection to a grounded outlet.

ADDITIONAL CHARGER INFORMATION

AUTOMATIC CHARGING AND BATTERY STATUS

MONITORING: The BATTERY TENDER® HEAVY DUTY 12V-12V DUAL 20 AMP CHARGER is completely automatic and may be left connected to both AC power and to the battery that it is charging for long periods of time. However, it is prudent to periodically check both the battery and the charger for normal operation during these extended charging periods.

The BATTERY TENDER® HEAVY DUTY 12V-12V DUAL 20 AMP CHARGER has status lights that indicate the operating mode of the charger, and the condition of the battery that is connected to the charger. The charger output power, voltage, and current all depend on the charge algorithm and the condition of the battery that is being charged. The continuity of the AC power that is connected to the charger is also a significant factor.

⚠ WARNING

BATTERY CONNECTION OR AC POWER INTERRUPTED:

1. If the battery connection to either charger output channel is interrupted, then the output of that channel will be shut off. However, as long as AC power is not interrupted, the program selection will remain the same as it was prior to the connection being interrupted.
2. If the AC power to the charger is interrupted then the output of both channels will revert to the default Flooded battery type.

The charger operates in one of the 4 primary charge modes: the BULK mode (full charge power, constant current, increasing battery voltage, battery is 0% to 75% or 80% charged), the ABSORPTION mode (high constant voltage, decreasing current, battery is 75% to 100% charged), the EQUALIZATION mode (higher constant voltage, with lower current limit), or the STORAGE / FLOAT MAINTENANCE mode (low constant voltage, minimal charge current, battery is fully charged, typically 100% to 103%).

SPECIAL FEATURES: The BATTERY TENDER® HEAVY DUTY 12V-12V DUAL 20 AMP CHARGER has the following special features:

SPARKPROOF: The battery charger DC output alligator clips must be connected to a battery before any output voltage is developed.

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: The battery charger is protected internally against any damage due to the DC output leads being connected to the opposite polarity battery post. No damage will result to either the battery or the battery charger.

TIME REQUIRED TO CHARGE A BATTERY:

The BATTERY TENDER® HEAVY DUTY 12V-12V DUAL 20 AMP CHARGER charges at a maximum rate of 20 Amps per channel, simultaneously (20 Amp-Hours per hour per channel). Therefore, a fully discharged 60 Amp-Hour battery will take approximately 2.25 hours to recharge to 75% capacity. To complete the full, optimum charge cycle on a 12 Volt battery will take approximately 6 hours.

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, an internal safety circuit prevents the BATTERY TENDER® HEAVY DUTY 12V-12V DUAL 20 AMP CHARGER from delivering full charge power. The charger will deliver a small, low-power current to bring the battery voltage up to 3 Volts.

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 INDICATOR LIGHTS: The following describes the LED indicator light operation:

- **RED BATTERY SELECTOR LIGHT ON** – AGM Battery selected.
- **GREEN BATTERY SELECTOR LIGHT ON** – FLOODED Battery selected. This is the default setting.
- **RED CHARGE AMPERES STATUS LIGHTS ON STEADY** – Whenever the red charge amperes status lights are on steady, the present value of the charge current is in the range of the highest numerical label on the farthest light to the right that it illuminated. The 5 red charge amperes status lights are labeled 4, 8, 12, 16, & 20. Each label indicates the highest value of the charge current being delivered when the red light is on. All red lights with lesser value labels than the highest light illuminated will also remain illuminated. If the charge current being delivered by one of the charger channels is between 12.1 and 16 amps. (The lowest value is an approximation. The actual low value may be closer to 12 amps as long as it is more than 12 amps.) In this case, the 16 ampere light will be on, and so will the 4, 8, and 12 ampere lights. The 20 ampere light will not be on. If the charge current is between just over 16 amps, then all 5 of the red lights will be on.
- **GREEN CHARGE COMPLETE STATUS LIGHT FLASHING** - When the green light is flashing, the battery is fully charged and ready for service. It is also possible that the red charge ampere status light labeled “4” may also be on when the green light comes on and begins to flash. It is also possible that additional red charge ampere status lights may come on after the green charge complete status light begins to flash. This may happen if the battery is supplying power to a load after the charge is complete, but

the charger is still connected and operating in Float / Maintenance mode.

- **GREEN CHARGE COMPLETE STATUS LIGHT ON STEADY** - This will occur when the AC power is first turned on and again when the battery is connected to the charger with the AC power on, and then finally when the battery is fully charged.

WHEN YOU TURN ON THE AC POWER: All 4 of the voltage selector LEDs around the voltage selector rocker switches turn on and stay on. The green charge complete status light turns on & each of the 5 red charge ampere status lights turn on in sequence from low to high until all 5 red lights are on. Then the process reverses itself and in sequence from high to low, each of the 5 red lights turn off until finally the green charge complete light also turns off. Immediately after the green charge complete light turns off, both red battery selector LEDs turn off, and the 2 green battery selector LEDs remain on.

WHEN YOU CONNECT THE ALLIGATOR CLIPS TO A BATTERY: The green charge complete status light comes on. As soon as the first red charge ampere status light comes on, the green charge complete status light turns off. Then more red lights will come on, in sequence until the optimum charge current for the battery is achieved.

BATTERY SELECTION: AGM OR FLOODED: The selections can be made separately. One channel can be charging with the FLOODED battery type while you change the battery type selection on the other channel to AGM. To select the battery type for each charger channel, with the AC power on, first make sure that the alligator clips for that channel are NOT connected to the battery.

1. To select **FLOODED**, do nothing, this is the default value. The Green LED should be on with the Red LED off.
2. To select **AGM**, just move the MOMENTARY rocker switch to the AGM position. The Red LED should turn off immediately and the Green LED should come on.

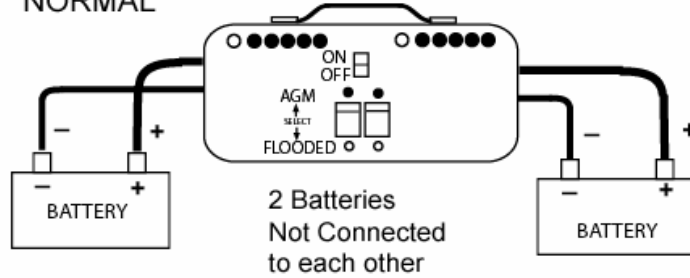
TROUBLESHOOTING CHECK LIST:

1. **NO CHARGER LIGHTS TURN ON AFTER THE AC POWER PLUG IS CONNECTED TO THE AC ELECTRICAL OUTLET AND THE AC ON/OFF SWITCH IS TURNED ON:** Check the charger AC power plug connection at the AC electrical outlet. Check the cartridge fuse (Bussmann ABC15A or equiv) on the back of the unit. Verify that the AC electrical outlet is functioning properly by plugging in another appliance or a voltmeter.
2. **THE GREEN CHARGER STATUS LIGHT GOES ON TOO SOON AFTER THE AC POWER IS APPLIED TO THE CHARGER:** The battery might already be fully charged, or the charger connections at the battery may be intermittent, or the battery may be defective.
3. **CHARGER IS CHARGING BUT THE GREEN CHARGE COMPLETE STATUS LIGHT DOES NOT TURN ON IN A REASONABLE AMOUNT OF TIME:** Remember, a large battery may require 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.
4. **THE GREEN BATTERY SELECTOR LIGHT COMES ON AFTER THE CHANNEL OUTPUT WAS SET TO AGM AND THE RED VOLTAGE SELECTOR LIGHT WAS ON.** The AC power may have flickered off & on. You must remove the alligator clips from the battery and repeat the AGM battery selection process.

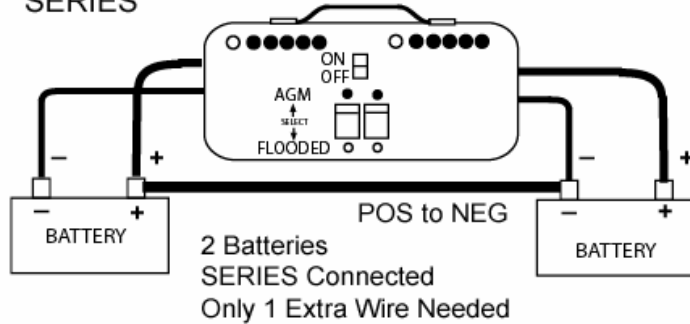
BATTERY CONNECTIONS TO THE CHARGER:

In each case the nominal battery voltage must be 12 volts. Always exercise caution when connecting the charger to the batteries. Pay particular attention to the diagrams below when the batteries are in series or parallel.

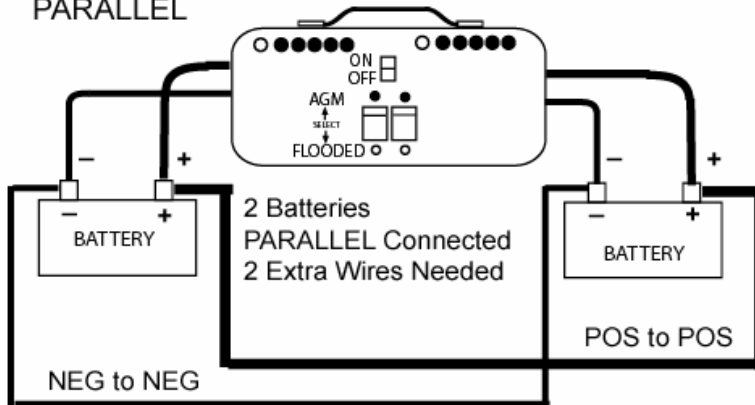
NORMAL



SERIES



PARALLEL



SPECIFICATION SUMMARY:

Technical Specifications	
Input Voltage / Frequency	100 to 132 VAC / 60 Hz
Input Current (Maximum)	9.0 Amps RMS
Output Current Typical	20 Amps DC per channel simultaneously
Output Voltage	12 Volts DC
Charger Output Voltage Amplitudes throughout the entire charge algorithm, including absorption, equalization, and float maintenance, are consistent with the optimum charging recommendations of the major lead-acid battery manufacturers.	
Maximum Operating Temperature	50 °C Typical
Charger Case Dimensions: 11.5 in (292mm) L x 8.625 in (219 mm) W x 6.625 in (168 mm) H.	
Shipping Weight: with Accessories: Approx. 28 lbs (12.75 kg)	

Design Conformance & Revision: All charger products are 100% inspected and electrically tested prior to shipment. All battery charger designs are proprietary and subject to change without notice.

WARRANTY: 2 YEARS FROM DATE OF PURCHASE

DELTRAN CORPORATION, 801 INTERNATIONAL SPEEDWAY BLVD., DELAND, FLORIDA 32724 MAKES THIS LIMITED WARRANTY TO THE ORIGINAL PURCHASER. THIS WARRANTY IS NOT TRANSFERABLE.

Deltran warrants the 12V / 12V Heavy Duty charger for 2 years from the date of purchase against defective material or workmanship only. If Deltran qualified service technicians determine that the likely cause of the battery charger product malfunction is due to either defective material or workmanship, then the battery charger will be repaired or replaced at the discretion of Deltran.

THIS LIMITED WARRANTY IS VOID under the following conditions:

- 1) The product is misused, subjected to careless handling, or operated under conditions of extreme temperature, shock, or vibration beyond Deltran's recommendations for safe and effective use.
- 2) The product is disassembled or repaired by anyone who is not a Deltran factory authorized service representative.
- 3) The electrical connections to either the AC input or the DC output of the charger are modified without the express written consent of the Deltran engineering department.

The manufacturer makes no warranty other than this limited warranty and expressly excludes any implied warranty including any warranty for consequential damages.

THIS IS THE ONLY EXPRESS LIMITED WARRANTY AND THE MANUFACTURER NEITHER ASSUMES NOR AUTHORIZES ANYONE TO ASSUME OR MAKE ANY OTHER OBLIGATION TOWARDS THE PRODUCT OTHER THAN THIS EXPRESS LIMITED WARRANTY. THE MANUFACTURER MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE OF THIS PRODUCT AND EXPRESSLY EXCLUDES SUCH FROM THIS LIMITED WARRANTY. SOME STATES MAY NOT ALLOW THESE EXCLUSIONS.

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