ULTRA TRIK-L-START™ REVISION E

Starting Battery Charger/Maintainer

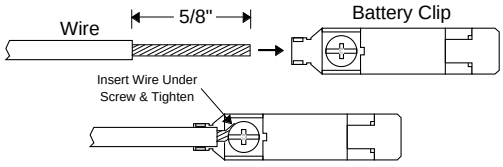
04/01/2013-REV E

GENERAL INFORMATION — Ultra TRIK-L-START™ is designed to keep your engine starting battery(s) fully charged during long periods of inactivity or storage. Connected between the house and starting batteries, it diverts current from your existing house battery charger, sending it to the starting battery(s) instead. Maximum charging current is 5 amps, automatically tapering to a small fraction of an amp after a full charge is reached. A set of indicator lights display the charger's status, also warning of improper hookup. A current backflow prevention circuit keeps the starting battery(s) fully charged, even if the house batteries are discharged during dry-camping. **TRIK-L-START™** is compatible with solid-state or relay-type battery isolators and battery selector switches. Since it doesn't require any connections to AC power, it also works well with solar panels. Battery clips and crimp-on ring terminals are both included, allowing for temporary or permanent installation.

Step-By-Step Instructions For TEMPORARY INSTALLATION

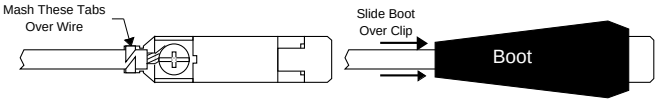
1

STEP 1: Pull the insulative boots off the battery clips (supplied). Strip approximately 5/8" (16MM) of insulation off the end of **TRIK-L-START**'s blue and yellow wires (see wire strip gauge at right), twisting any frayed strands back together again. Slide a **RED** insulative boot over the end of each wire, then connect the stripped ends of the wires to the screws on the battery clips.



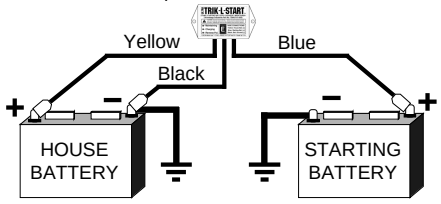
Wire Strip Gauge — 5/8" (16MM)

Next, use a pair of pliers to mash the battery clip's strain-relief tabs over the insulated portion of the wire, so that tugging on it doesn't separate the wire from the clip. Finally, slide the insulative boot down over the clip, so that only the clip's jaws are exposed. Do the same with the black wire, using the **BLACK** insulative boot instead.



2

STEP 2: Attach the YELLOW wire battery clip to the POSITIVE terminal of a HOUSE battery. (If your house battery bank consists of 6 volt golf-cart pairs, connect the YELLOW wire to the POSITIVE terminal of which ever golf cart battery that is NOT connected to the negative terminal of the other golf cart battery.) Next, attach the BLUE wire battery clip to the POSITIVE terminal of a STARTING battery. Finally, attach the BLACK wire battery clip to the NEGATIVE post on either the house or starting batteries. This completes the installation process.



***TIP**: These connections can instead be made to terminals on the the battery isolator, relay or selector switch — This helps avoid long wire runs and corroded clips. If additional wire is required, use 18 Gauge or thicker.*

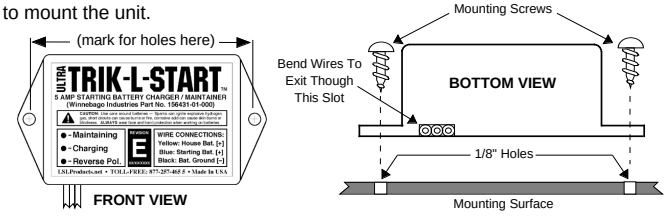
CAUTION!

USE CARE AROUND BATTERIES — SPARKS CAN IGNITE HYDROGEN GAS. SHORT CIRCUITS CAN CAUSE BURNS OR FIRE. CORROSIVE ACID CAN CAUSE SKIN BURNS OR BLINDNESS.

Step-By-Step Instructions For PERMANENT INSTALLATION

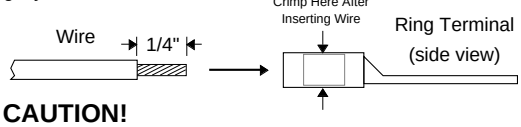
1

STEP 1: Identify a flat mounting surface, preferably near the battery isolator, relay or selector switch (see "Where's The Isolator?" on next page). Check that drilling holes won't interfere with any wiring, hoses or other parts on the other side. Next, temporarily hold the **TRIK-L-START™** unit against the intended mounting surface, and mark the hole locations for the two mounting screws. Drill 1/8" (3MM) holes at these locations. After bending the wires so that they exit through the slot at the bottom edge of the unit, use the 2 supplied screws to mount the unit.



Determine how long the blue, yellow and black wires need to be in order to reach their intended connection locations, and cut off any excess wire. Strip approximately 1/4" (6 MM) of insulation off the ends of each of these wires, twisting any frayed strands back together again. Next, insert a ring terminal (supplied) into the end of each of these wires, and crimp the terminal tightly.

Wire Strip Gauge — 1/4" (6MM)

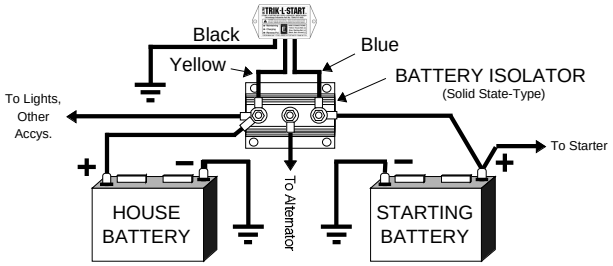


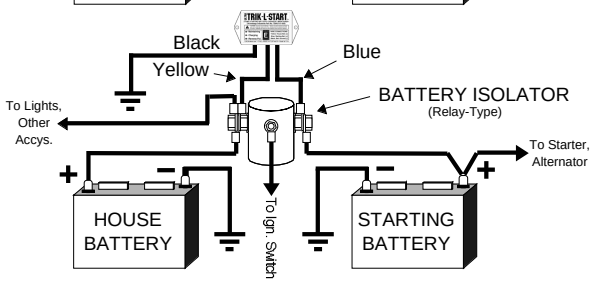
CAUTION!

USE CARE IN DRILLING HOLES NOT TO CONTACT ANY ELECTRICAL WIRING — HAZARD OF SHOCK, FIRE, BURNS.

2

STEP 2: Unplug from shore power, disconnect any solar panels, and remove the negative terminals of **BOTH** the house and starting battery banks. Attach TRIK-L-START's ring terminals to the proper studs on the battery isolator, relay or selector switch. The YELLOW wire goes to the stud connected to the HOUSE battery; the BLUE wire goes to the STARTING battery stud, and the BLACK wire goes to chassis ground. Reattach the negative battery terminals (confirming that the red REVERSE POLARITY indicator is not lit), reconnect any solar panels and restore shore power. This completes the installation process.



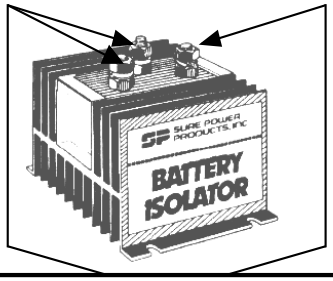


“Where's The Isolator?”

TRIK-L-START™ never needs to be disconnected, which makes it perfect for permanent installation. The ideal place to permanently connect it is to the terminals on your battery isolator, switch or emergency start relay. This is preferable to connecting it directly to the posts on your batteries, since it avoids corrosion due to battery acid. Also, your isolator or relay already has both batteries connected to it, eliminating the need to run new wires from the **TRIK-L-START™** to each battery bank.

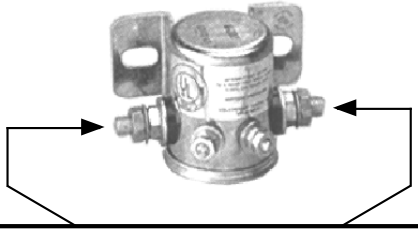
WHERE TO LOOK FOR THE ISOLATOR — The isolator is often located either inside or immediately next to the engine compartment:

If a solid-state isolator is present, it will look very similar to this:



At the factory, the manufacturer has connected one of these terminals to the positive terminal of your house battery bank. Another terminal is connected to the positive terminal on your starting battery(s), and the last terminal is connected to the DC output from your engine's alternator.You want to connect Trik-L-Start's YELLOW wire to the terminal that goes to the HOUSE batteries, and connect Trik-L-Start's BLUE wire to the terminal that goes to the STARTING battery(s). Some isolators show the connections on an attached sticker or label.

If a relay (or solenoid)-type isolator is present, it will look very similar to this:



At the factory, the manufacturer has connected one of these large terminals to the positive terminal of your house battery bank. The other large terminal is connected to the positive terminal on your starting battery(s). You want to connect Trik-L-Start's YELLOW wire to the terminal that goes to the HOUSE batteries, and connect Trik-L-Start's BLUE wire to the terminal that goes to the STARTING battery(s).

Note: Occasionally, more than one similar-looking relay is present. The isolator relay (also sometimes labeled "EMERGENCY START RELAY") is the one that will "click" whenever the engine ignition switch is turned from the "off" to "run" positions.

HOW TO TELL WHICH WIRE GOES TO WHICH BATTERY — When plugged into AC power (so that your DC converter or AC inverter is charging the house batteries), the wire that goes to your house batteries will measure around 13.5 to 14.5 volts (measuring between the terminal and ground). The wire that goes to your starting batteries will measure less than this (around 12.3 to 12.7 volts). If you don't have access to a DC voltmeter, you can use a 12-volt light bulb or test light instead — Temporarily disconnect the positive terminal of your starting battery and see which terminal on the isolator still lights the bulb. That will be the wire that goes to the house batteries. Reconnect the starting battery, and perform the same test on the house batteries (which will tell you which wire goes to the starting battery).

General Information

HOW IT WORKS — TRIK-L-START™ works by "borrowing" some charging current from the house batteries, using it to also recharge and maintain the starting battery(s). This only happens when the house batteries are receiving a charge from your DC power converter, AC inverter-charger or solar panels — The rest of the time, **TRIK-L-START™** is inactive, and doesn't affect the electrical system. After both the starting and house batteries become fully charged, **TRIK-L-START™** continuously applies a small maintenance charge to the starting battery(s). During periods of dry-camping when the house batteries are being discharged, **TRIK-L-START**'s current backflow prevention circuit ensures that the starting battery stays fully charged.

OPERATING INFORMATION — In the absence of any AC shore power (or shortly after shore power is disconnected or solar panel output ceases), the green MAINTAINING light will blink aprox. once per second, indicating that **TRIK-L-START** is in standby mode. Shortly after shore power is present, either the green MAINTAINING or yellow CHARGING lights will glow steady, indicating that the starting batteries are receiving either a small maintenance (green light illuminated) or substantial charging (yellow light illuminated) current. Typically, standby mode occurs whenever the house battery voltage drops below 12.8 volts, and is canceled when the house battery voltage exceeds 13.0 volts.

MAINTENANCE TIPS: Battery water levels should be periodically checked. Also, if the unit is temporarily installed with battery clips, periodically check to insure that the clips are making good contact with the battery terminals, and that no clip corrosion is taking place.

NOTE: If disconnect switches are present for the house and/or starting batteries, we recommend leaving them in their CONNECTED positions any time other than during long-term storage without AC hookups or solar power. Also, note that any adjustments to the final (or "float") voltage settings on your house battery charger will have a similar effect on the starting battery's final maintenance voltage – Generally, a final (fully-charged) setting of 13.5 VDC is recommended for the house batteries, which will result in a nearly-identical voltage on the fully-charged starting battery(s).

In Case Of Trouble – If Starting Battery Does Not Stay Charged:

1. Confirm that the YELLOW wire is making a solid connection to your HOUSE battery POSITIVE terminal, the BLUE wire is solidly connected to your STARTING battery POSITIVE terminal, and the BLACK wire is solidly connected to chassis ground (or the negative terminal on either battery). The REV POLARITY light indicates incorrect connections. Either the CHARGING or MAINTAINING lights should glow steady whenever shore power or some other recharge source is supplying a charge to the house batteries, or the MAINTAINING light should be blinking when no recharge source is present - If neither light is ever lit, check for poor or improper connections.

NOTE: If the house batteries are significantly discharged, it can take some time for your house battery charger to raise their voltage above the point where TRIK-L-START comes out of standby mode (i.e., either the CHARGING or MAINTAINING lights glow steady). Also, after shore power is disconnected, it can take some time for the house battery voltage to drop below the point where TRIK-L-START goes into standby mode (i.e., the MAINTAINING light blinks approx. once per second).

3. Check that no significant full-time loads are connected to the starting battery(s). If present, any loads must not be large enough to exceed **TRIK-L-START**'s maximum output capacity. Also, note that a battery's self-discharge load becomes much higher as it approaches the end of its useful life – Thus, failure to make the normal shift from CHARGING to MAINTAINING states may be a clue that the starting battery needs replacing.

4. Confirm that the house batteries are present and in good condition. Absent, defective or dried-out house batteries may adversely affect **TRIK-L-START**'s operation.

Warranty

LSL Products warranties this unit for a period of **ONE YEAR** from the date of purchase against defects in materials and workmanship. Please save your receipt as proof of warranty coverage. LSL Products will, at its option, repair or replace any defective components, at no charge to the owner. Please contact us prior to returning the unit. This warranty does not cover damage due to improper installation or unreasonable use of the product. In no event shall LSL Products nor any of its representatives be responsible for incidental or consequential damages. This warranty gives you specific legal rights, and you may have other rights which vary from state to state.