

# TROLLBRIDGE24<sup>®</sup> COMBINER

## CHARGE 24 VOLT TROLLING BATTERIES FROM 12 VOLTS

### SUMMARY

© July 2010

The Trollbridge24<sup>®</sup> Combiner allows you to charge your 24 volt trolling motor battery from the 12 volt alternator on your main engine, your trailer hookup or any single or multi-output 12 volt charger. It works automatically by putting two 12 volt batteries in series when you need to run the trolling motor and putting them in parallel for charging. It is bidirectional so when not trolling, the second trolling battery backs up your starting or house battery.

### FEATURES

- < Fully automatic, no switches or connectors to change
- < Manual 12/24 volt switching available
- < Can use starting battery if desired, for a 2 battery setup
- < Both batteries operate in parallel when not trolling
- < Eliminates the need for multiple output chargers
- < Can be conveniently located with the batteries
- < Rated for 12 volt alternators up to **150 amps**
- < Rated for 24 volt trolling motors up to **85 amps**
- < Green LED indicates 24 volt output active
- < Optional remote indicator compatible §
- < Nearly UNLIMITED warranty \*
- < Waterproof - will operate submerged in salt water
- < Ignition rated for explosive atmospheres
- < No voltage drop so batteries reach full charge
- < No voltage drop so motor gets full power
- < No wasted power, no heat sink or cooling required
- < No modification to alternator or 12 volt wiring
- < Simple 5 wire basic installation
- < Comes with all cables for basic hookup
- < Draws no current when off
- < No diodes to burn out if accidentally shorted
- < Withstands ambient temperature to over 175EF (80EC) for engine compartment mounting

**DANGER: During installation voltages may be present on unattached cables. Make sure these do not short out to boat ground, battery positive, or to each other.**

### HOW IT WORKS

The Trollbridge24<sup>®</sup> uses two 12 volt batteries to make 24 volts. They are in parallel at 12 volts when not trolling.

One of these batteries can be either the normal starting battery (Schematic A), or a 12 volt "house" battery if your boat has one (Schematic B). If you use the house battery, it should be connected to the starting battery with a battery Combiner100 so both batteries will get a charge from the alternator when the main engine is running.

The other "trolling" or "booster" battery is used only for the trolling motor and **cannot be connected to anything else.**

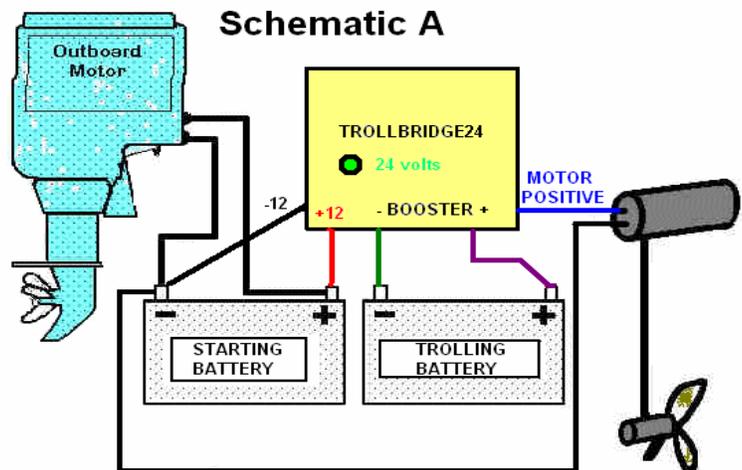
The Starting battery (or House battery if used) can also be used for other 12 volt loads.

**CAUTION** If your trolling motor has a built in fish finder transducer some of these do not allow a common ground. Check with the manufacturer to see if it is compatible.

### INSTALLATION

We recommend 6 gauge wire for the motor cables and for extending the supplied cables. The 10 gauge wire supplied is used for current limiting protection - see explanation under WARRANTY at end of these instructions.

Since the connections made in the battery circuits can carry hundreds of amps, it is imperative that you have low resistance connections. This means having clean metal to metal contact, the right size ring terminals, properly crimped terminals, and secure mechanical fastenings.



1. **IMPORTANT** Remove any existing jumper from battery **1 positive to battery 2 negative**. Sometimes this jumper is inside the trolling motor plug.
2. Any existing battery charger cables can be left as-is.
3. Connect the **BLACK** Trollbridge24<sup>®</sup> ground wire to the common negative of your main 12 volt starting or house battery ground terminal. Lengthen with 8 or 6 gauge wire if needed.
4. The **RED** cable is connect to the positive terminal of the main 12 volt starting or house battery. If you want a safety breaker in this circuit it should be rated at 100 amps maximum. **SHORTENING THIS CABLE WILL VOID THE WARRANTY \***. Extending with 6 gauge wire is OK.  
The connections do not have to be made right on the battery terminals but any wire or cables between the battery and the Trollbridge24<sup>®</sup> must be heavy enough to carry the trolling motor current in addition to any existing.
5. Connect the **GREEN** cable to the trolling battery negative terminal. **No other connections should be made to this negative battery terminal. SHORTENING THIS CABLE WILL VOID THE WARRANTY \***. Extending with 8 or 6 gauge wire is OK.

6. Connect the **WHITE** (or **PURPLE**) cable to the trolling battery positive terminal. **SHORTENING THIS CABLE WILL VOID THE WARRANTY \***. Extending with 8 or 6 gauge wire is OK. **No other connections should be made to this positive battery terminal.**
7. The **BLUE** cable connects to the trolling motor positive input. This cable can be shortened if desired. **No other connections should be made to this cable.** Extend with 8 or 6 gauge wire where necessary. A circuit breaker in this circuit, current rated for your motor, is recommended.
8. The negative side of the trolling motor connects to the main negative terminal of the starting/house battery. It does **not** connect to the negative terminal of the trolling battery. 8 or 6 gauge wire is recommended.
9. § If you want to install an **optional remote** indicator that shows when you are in 24 volt mode use a 12 volt panel mount indicator and connect one wire on the common negative (**BLACK**) terminal and the positive indicator wire on the Trolling Battery **negative (GREEN)** wire. If it is a 12 volt LED style lamp, the green wire is the positive connection.
10. The short **yellow** wire is rarely needed.

## OPERATING INSTRUCTIONS.

The Trollbridge24<sup>®</sup> automatically puts the batteries in series whenever you turn on the trolling motor. When not trolling, there is 12 volts going to the motor to detect when it gets turned on. Within a few milliseconds of being turned on, the voltage switches to 24 volts and the **GREEN LED** turns on.

When the trolling motor is off for about 20 seconds the batteries are put back in parallel. If the main engine is running both batteries will receive a charge when they are in parallel and both are available for starting or house loads.

Running both motors at the same time does no harm. Unequal charging on the batteries is not a problem since the batteries equalize every time the trolling motor is off.

12/24 volt motors will work OK. They will use both batteries in parallel for 12 volts and in series for 24 volt operation. Connect the 12 volt motor input to the same battery terminal as the **RED** wire from the Trollbridge24<sup>®</sup>.

Although the Trollbridge24 draws no current when idle many trolling motors draw current even when turned off so the breaker in the **BLUE** cable should be turned off or the motor unplugged when not in use.

## TROUBLE SHOOTING

The amount of charging available is limited by the alternator output and how long it runs. Older outboard alternators often have minimal output so running time for the trolling motor will be governed by the running time of the main engine and the battery capacity.

A buzzing sound when applying a 24 volt load indicates that one of the batteries is not connected.

If it fails to switch to 24 volts when you turn on your trolling motor **double check your wiring** but it may be because the electronics won't operate while in the 12 volt mode. To use the Trollbridge24<sup>®</sup> you will need to install a **MANUAL CONTROL** switch that connects the short, light gauge **yellow** wire to the **+12** volt battery terminal that has the **RED** Trollbridge24<sup>®</sup> cable on it. When turned ON you will have 24 volts. When turned off it will switch back to 12 volts for charging after a short delay. Light gauge wire is OK for the switch.

If it fails to switch to parallel (after a delay) when the trolling motor is turned off the motor controls may be drawing current even when OFF. You will need a switch in the **BLUE** cable such as a 50 amp breaker to prevent it discharging batteries and allow the Trollbridge24<sup>®</sup> to switch back to 12 volt charging mode.

## SHORE POWER CHARGING

A **single output shore power charger** can be connected to the starting battery or house battery to charge all batteries. If you have a multi-output charger already installed there is no need to change the connections.

## WARRANTY

**\* WARRANTY VOID IF POWER LEADS ARE SHORTENED**

otherwise we offer an unlimited replacement warranty. These leads cannot be shortened because they provide a few milliohms of resistance that protects the Trollbridge24<sup>®</sup> from excessive current when batteries at different voltages are switched in parallel. There is no detrimental effect at normal operating currents.

Check at <http://www.yandina.com/AboutUs.htm>

to get service information and the warranty return address.

**TECHNICAL EMAIL QUERY** [tech@yandina.com](mailto:tech@yandina.com)

or call 877 355 2184 toll free

(843 524 2282 overseas direct).

