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STEP BY STEP INSTALLATION INSTRUCTIONS

Trollbridge 12x24/24L

24-Volt Charger/Combiner

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How The Trollbridge 12x24 Charger/Combiner Works

The SmartShore Marine Trollbridge 12x24™ Charger/Combiner allows you to charge your 24-Volt trolling motor batteries from the 12-Volt alternator on your outboard. It will do the same with any single output 12-Volt charger, or even your trailer hookup. It works automatically by switching the battery connections from 12-Volts (parallel) to charge, to 24-Volts (series) when you need to run the trolling motor. It only charges the trolling batteries when the main engine is running.

Features

- Fully automatic changeover from running to charging
- Simple 6-wire installation with included cables
- You can run BOTH motors at the same time
- Automatic switching to 24-Volt output for trolling
- Automatic switching to 12-Volt charging when not trolling and engine is running
- Built in Combiner isolates starting battery from discharge
- Draws no current when off
- Rated for 12-Volt charging sources up to 100-Amps
- Compatible with most 24-Volt trolling motors (up to 85-Amps)
- Two (2) versions available; one (1) for Lithium batteries and one (1) for standard Lead-Acid batteries
- Batteries are charged in parallel to equalize their charge for longer life
- Green LED on the Trollbridge 12x24 shows when 24-Volt output is active
- Amber LED indicates charging is in progress
- Compatible with but eliminates the need for multiple output chargers
- Draws no current when off
- No modification to alternator or 12-Volt wiring required
- Compact, waterproof design and included cables make installation easy
- Efficient electronics design requires no heat sink or cooling fan
- Withstands ambient temperature to over 175° F (80° C)
- Warranty information is available at the end of these instructions

Parts & Tools For Installation

- 60-Amp circuit breaker with an on/off switch – To trolling motor
- Four (4) 100-Amp slow blow fuses – One (1) to trolling motor battery positive (+) post
- Self-tapping screws
- 6- to 10-gauge wire for possible cable extensions
- Additional wire terminals for possible cable extensions

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Operating Modes



TROLLING MODE

The Trollbridge 12x24 automatically switches from Charging to Trolling Mode when you turn on the trolling motor. Trolling Mode activates quickly when the trolling motor is detected, and the GREEN LED will turn on to indicate 24-Volts is going to the trolling motor.

When the trolling motor is active the Trollbridge 12x24 powers off. While off, the Trollbridge 12x24 draws no power, so it can always remain connected to the batteries.



CHARGE MODE

Charge Mode will activate when the trolling motor is off for about thirty (30) seconds. If the main engine is running and the starting battery is over 13-Volts, the amber LED will turn on and all batteries will receive a charge from the engine's alternator.

The first trolling battery can also be used as a house battery for other 12-Volt loads. The second trolling battery is used only for the trolling motor and CANNOT be connected to other electronic devices.

Running both motors (engine and trolling) at the same time does no harm although only one (1) battery will get charged. Because the batteries are equalized every time the trolling motor is off, unequal charging on the batteries is not an issue.

12/24-Volt motors will work with the Trollbridge 12x24 as well but do require specific wiring instructions outlined at the end of the installation instructions (Step 18 on Page 12). These trolling motors will use both batteries in parallel for 12-Volts and in series for 24-Volt operation.

Battery Chargers



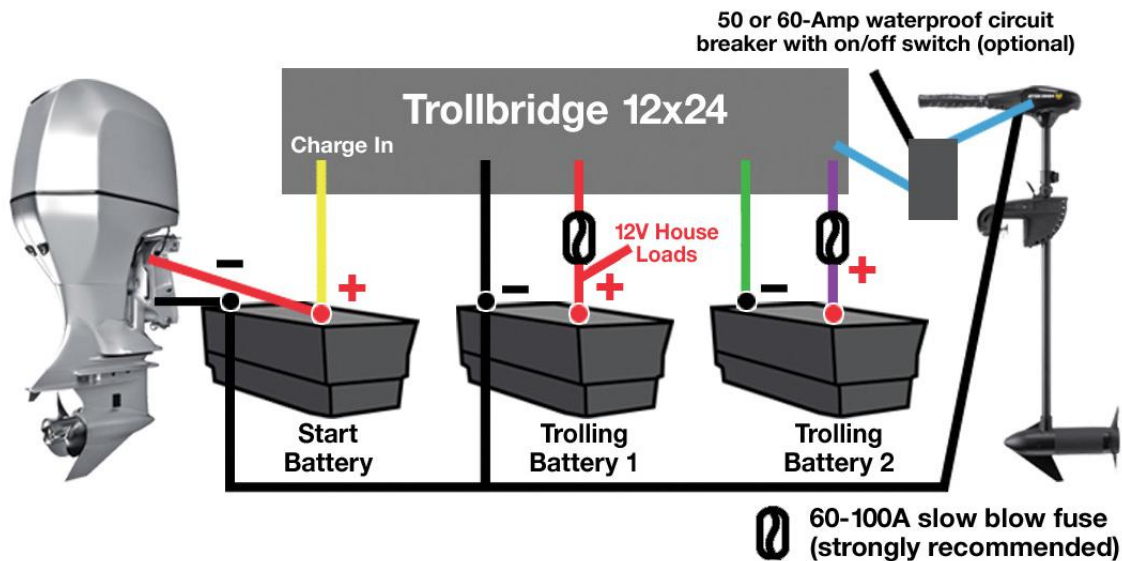
Multi-Output Battery Charger (Shore Power Charger)

The Trollbridge 12x24 is compatible with multi-output chargers, but they are not necessary. If you already have a multi-output charger you can configure it two (2) ways; separate from, or through the Trollbridge 12x24. Your multi-output battery charger can be left in place in the normal configuration with each charger bank connected to an individual battery. Do NOT run your outboard engine and the external multi-output battery charger at the same time. Damage could occur. An alternative method to use your multi-output battery charger is to connect all positive and all negative charger outputs to the battery with the YELLOW wire on it. This makes your multi-output charger function like a single output charger and allows the Trollbridge 12x24 to equalize the charge of all batteries which can extend their life.



Single Output Battery Charger (Shore Power Charger)

When a single output charger is connected to the starting battery, the Trollbridge 12x24 will function as normal and charge all batteries equally.

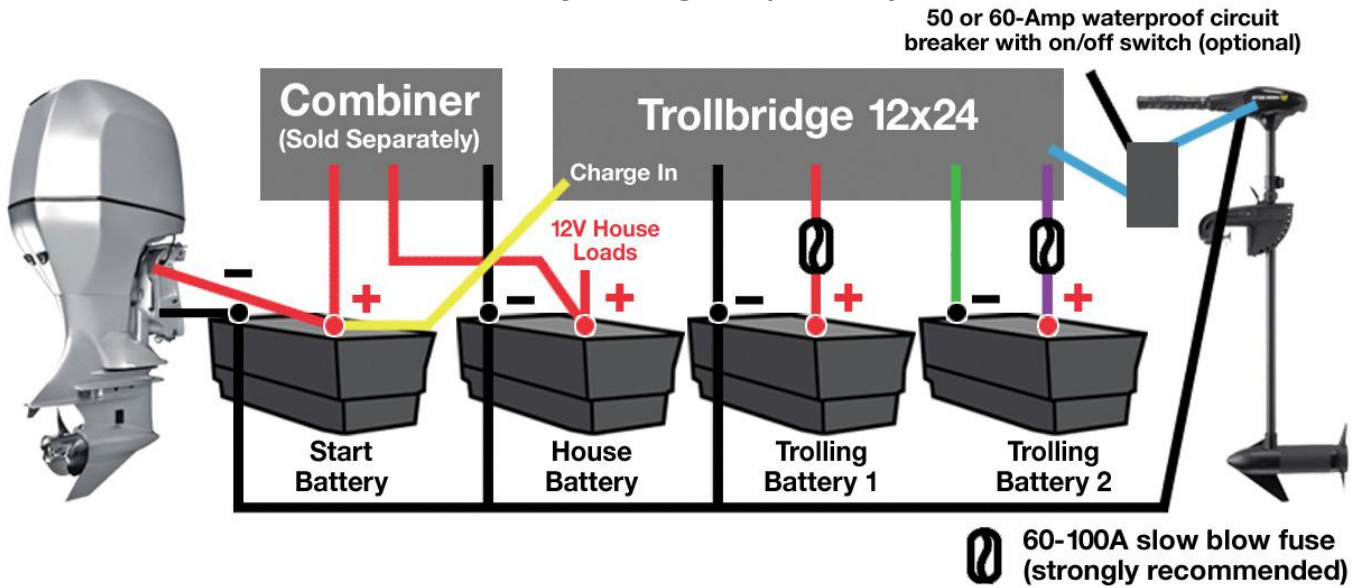


3 BATTERY SYSTEM

This configuration uses a large 12-Volt battery to start the engine and combine with a 12-Volt trolling batteries to combine for 24-Volts. The starting battery typically has a much larger capacity than the trolling battery so you can still start the engine when the trolling battery is low.

NOTE: For the 3-battery system, you will omit the starting battery and connect the main engine to the battery with BLACK and RED cables. The YELLOW cable will go to the same terminal as RED if using the starting battery for trolling.

Battery Chargers (Cont'd)



4 BATTERY SYSTEM

This configuration uses the starting battery, house battery, and separate trolling batteries to make 24-Volts. The trolling motor should be dedicated and NOTHING else should connect to it. For maximum life, the batteries should be matched as closely as possible for age, capacity, and chemistry. The trolling motor will never use power from the starting battery. The Starting battery and House battery will connect in series together through the additional Combiner (sold separately), and the Trollbridge 12x24 will combine these with the Trolling battery together to provide 24-Volts to the trolling motor when Trolling Mode is active.

Trollbridge 12x24 Safeguards



Safeguards

Care must be taken during the installation process of your Trollbridge 12x24. Damage to the batteries and/or electrical equipment can occur if the Trollbridge 12x24 is installed or configured incorrectly. Please read through these instructions completely before installation.

This installation process will require you to work near multiple batteries. The utmost caution is advised, so having a second person who can come to your aid is ideal.

- **Assistant** - Have a second person who can come to your aid if necessary
- **Soap and Water** – Have soap and water nearby in case battery acid contacts skin, eyes, or clothing
- **Protective Wear** – Use full eye/clothing protection. Do not touch your eyes while working near battery
- **No Smoking** – Never smoke while working near battery
- **Metal Tools** – Reduce the risk of dropping metal tools onto your battery as sparking, a short circuit, an explosion, or other calamity may ensue
- **Jewelry** – Remove any metallic jewelry, watches, etc. before working on a battery as touching these to a battery could cause burns or worse
- **Frozen Battery** – Never charge a frozen battery
- **Corrosion** – Avoid battery corrosion from contacting your eyes or skin

Trollbridge 12x24 Installation

WARNING! Don't Destroy Your Trollbridge 12x24

Our quality control requires that each Trollbridge 12x24 is thoroughly tested and passes various tests multiple times prior to shipment. If you install it improperly you can destroy it. The cost for a replacement after improper installation can be up to half the original purchase price plus shipping to replace. To avoid the risk of melted cables or fire you SHOULD install a circuit breaker, current rated for your trolling motor, on the positive connection to the trolling motor (Blue wire). We also recommend the installation of a 100-Amp in-line fuse on the Purple (or White) wire from the Trollbridge 12x24 unit to the positive post on each of the trolling motor batteries (+12V). An additional circuit breaker, rated at 100-Amps maximum, installed on the RED wire going to the Starting battery is recommended as well. These fuses and circuit breakers will help to protect against wiring errors during the installation. The recommended fuse holders and replacement fuses are available to purchase in the Accessories section of our website (SmartShoreMarine.com).

Fuses And Circuit Breakers

The positive feed to the trolling motor should always have a circuit breaker, 60-Amp rating is typical. For ultimate protection and ABYC compliance, the yellow, red, and purple/white wires to the battery positive terminals could be fitted with disconnect switches and 100-Amp slow blow fuses but if the wiring is well protected from accidental damage they are typically omitted.

Wiring

The following connections do not have to be made right on the battery terminals. Any wire or cable extensions between the battery and the Trollbridge 12x24 must be heavy enough to carry the trolling motor and charging currents. We recommend 6- to 10-gauge wires, or larger for longer distances.

DO NOT bundle cables in plastic conduit, their current rating is only for open air. In conduit they may overheat.

DO NOT operate the Trollbridge 12x24 with damaged wires.

DO NOT operate the Trollbridge 12x24 if it has been dropped or otherwise damaged in any way.

NOTE: SHORTENING ANY Trollbridge 12x24 SUPPLIED CABLES WILL VOID THE WARRANTY.

The Trollbridge 12x24 connects the batteries together in parallel (12V) when in Charge Mode. When multiple batteries are connected in parallel there can be a very high current flowing from the one at a higher voltage to the one at a lower state of charge. The length and size of the leads supplied provide a resistance to high currents which protects the Trollbridge 12x24 from damage when the batteries are charging. Extending the wires with 6- to 10-gauge wire is OK. Cutting off existing terminals to make extensions is OK. Damage caused to the Trollbridge 12x24 by shortening the wires is not covered under warranty.

Trollbridge 12x24 Installation (Cont'd)



CLEAN BATTERY TERMINALS BEFORE CHARGING BATTERIES

Lead Acid – After the battery has been charged, fill each battery to the appropriate level with distilled water. Do not add water to a discharged battery or it may result in acid leaking which could cause injury or damage to your boat.

Check the battery fluid level and terminals for corrosion every thirty (30) days.



1. READ & UNDERSTAND INSTRUCTIONS BEFORE BEGINNING INSTALLATION

Read through these instructions and understand them before you begin installation of the Trollbridge 12x24. If you have any questions about the operation or installation, please call or email us before you proceed.

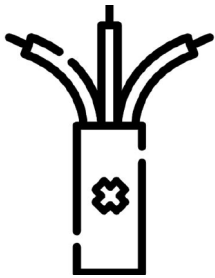
Technical Support: 901.382.8888 Mon. - Fri. 8am - 5pm, Central Time

Email: Tech@SmartShoreMarine.com



2. CONFIGURE FOR YOUR BATTERY CHEMISTRY

Before connecting your Trollbridge 12x24, verify that you have the correct model for your battery chemistry. The standard Trollbridge 12x24 is made to work on standard, Lead-Acid, AGM, or Wet-Cell batteries. For Lithium batteries you will need the Trollbridge 12x24 for Lithium (12x24L), which is an alternate part number.



3. REMOVE ALL EXISTING CABLES FROM THE BATTERIES

If you have jumpers in place on your batteries, you must remove these first. **Leaving the serial + to - jumpers in place it will INSTANTLY destroy the Trollbridge 12x24 and could injure you and cause a fire.**



4. LABEL YOUR BATTERIES

The Trollbridge 12x24 output wires are color coded and must be connected to specific battery terminals in your system for the unit to function properly. Use the supplied stickers to label the battery terminals **BEFORE** you start making connections. Have someone (friend, wife, etc.) check them **BEFORE** proceeding.

BLACK – Starting Battery, Negative (-) **YELLOW** – Starting Battery, Positive (+)

BLACK – Trolling Battery 1, Negative (-) **RED** – Trolling Battery 1, Positive (+)

GREEN – Trolling Battery 2, Negative (-) **BLUE** – Trolling Motor, Positive (+)

PURPLE/WHITE – Trolling Battery 2, Positive (+)

Trollbridge 12x24 Installation (Cont'd)



5. MOUNTING LOCATION

Mount the Trollbridge 12x24 such that you can see the green Charging LED. This will need to be in an area that is away from a direct heat source, vibration, gas vapors, battery gases, and above the boat waterline. The battery compartment will typically meet these requirements. Use bolts/nuts/washers to securely mount the Trollbridge 12x24 in order to withstand the pounding boats regularly endure on rough waters.



6. INSULATE YOUR TERMINALS

During installation, use the provided terminal booties to insulate the wire terminals crimped to the end of each wire. Unconnected cables will have battery voltage coming from cables that have already been connected. **If these short out to anything or to each other, you can melt wires, blow fuses, damage equipment, or cause a fire.**



7. VERIFY BEFORE COMPLETING THE INSTALLATION

Have the second person who is assisting with the installation verify the Trollbridge 12x24 wire color and the connection location before making the ring terminal to battery post and completing the connection for each wire. **Follow the suggestions under SAFEGUARDS on Page 6 of this manual as they are there to protect you, your boat's equipment, and your new Trollbridge 12x24.**

Important Information About The Wiring

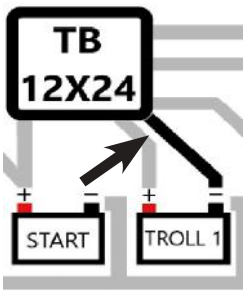
See Fuses and Circuit Breakers section on pages 7 or 17. The following connections do not have to be made right on the battery terminals but any wire or cable extensions between the battery and the Trollbridge 12x24 must be heavy enough to carry the trolling motor and charging currents. The Trollbridge 12x24 terminals are designed to be permanently connected to the batteries.

NOTE: SHORTENING ANY Trollbridge 12x24 SUPPLIED CABLES WILL VOID THE WARRANTY. Extending with 6- to 10-gauge wire is OK. Cutting off existing terminals to make extensions is OK.

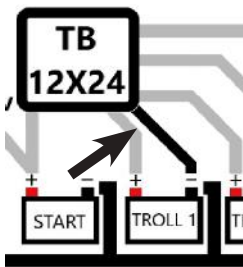
DO NOT bundle cables in plastic conduit, their current rating is only for open air. In conduit they may overheat.

To avoid the risk of melted cables or fire you SHOULD install a circuit breaker, current rated for your trolling motor, on the positive connection to the trolling motor (Blue wire). We also recommend the installation of a 100 Amp in-line fuse on the Purple (or White) wire from the Trollbridge 12x24 unit to the positive post on each of the trolling motor batteries (+12V). An additional circuit breaker, rated at 100-Amps maximum, installed on the RED wire going to the Starting battery is recommended as well. These fuses and circuit breakers will help to protect against wiring errors during the installation. The recommended fuse holders and replacement fuses are available to purchase in the Accessories section of our website (SmartShoreMarine.com).

Trollbridge 12x24 Installation (Cont'd)

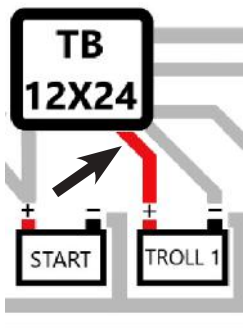


8. Connect the BLACK Trollbridge 12x24 ground (-) wire to the negative (-) terminal of the Starting battery. This terminal also connects to the ground wire of the engine and the negative (-) side of the trolling motor. Extending this wire with 8- or 6-gauge wire can be done, if necessary.



9. Connect the negative (-) terminal of the Trolling Battery 1 to the negative (-) terminal of the Starting battery. This terminal also connects to the ground wire of the engine and the negative (-) side of the trolling motor. Extending this wire with 8- or 6-gauge wire can be done, if necessary.

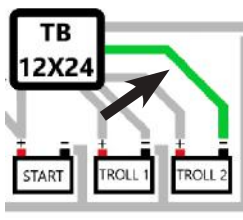
NOTE: This battery can be used as a House battery for other 12-Volt loads.



10. Connect the RED cable to the Trolling Battery 1 positive (+) terminal. **Shortening this cable will VOID the warranty.** Extending this wire with 8- or 6-gauge wire can be done, if necessary.

For ultimate protection and ABYC compliance, this wire should be fitted with a 60-Amp circuit breaker with an on/off switch and 100-Amp slow blow fuse. If fused, the RED cable must also be fused.

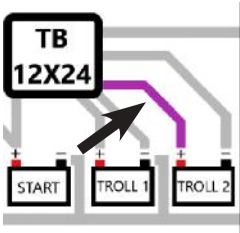
NOTE: This battery can be used as a House battery for other 12-Volt loads.



11. Connect the GREEN cable to the Trolling Battery 1 negative (-) terminal. **Shortening this cable will VOID the warranty.** Extending this wire with 8- or 6-gauge wire can be done, if necessary.

NOTE: This battery CANNOT be connected to any other electronic loads or the Trollbridge 12x24 will not operate correctly.

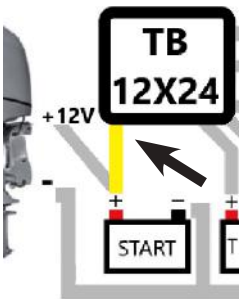
Trollbridge 12x24 Installation (Cont'd)



12. Connect the PURPLE (or WHITE) cable to the Trolling Battery 2 positive (+) terminal. **Shortening this cable will VOID the warranty.** Extending this wire with 8- or 6-gauge wire can be done, if necessary.

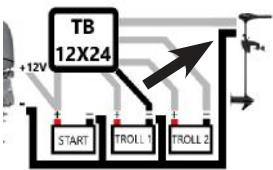
For ultimate protection and ABYC compliance, this wire should be fitted with a 60-Amp circuit breaker with an on/off switch and 100-Amp slow blow fuse. If fused, the RED cable must also be fused.

NOTE: This battery **CANNOT** be connected to any other electronic loads or the Trollbridge 12x24 will not operate correctly.

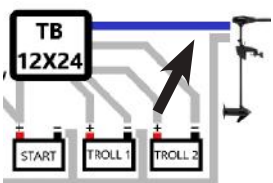


13. The YELLOW cable is connected to the positive (+) terminal of Starting battery. **Shortening this cable will VOID the warranty.** Extending this wire with 8- or 6-gauge wire can be done, if necessary.

For ultimate protection and ABYC compliance, this wire should be fitted with a 60-Amp circuit breaker with an on/off switch and 100-Amp slow blow fuse.



14. Connect the negative (-) side of the trolling motor to the negative (-) terminal of Trolling Battery 1. This terminal also connects to the ground wire of the engine and the negative (-) side of the Starting Battery 1. **It does NOT connect to the negative (-) terminal of the Trolling battery 2.**



15. Connect the BLUE cable to trolling motor positive (+) input. 6-gauge wire is normal and can be used to extend this wire, if necessary. A 60-Amp circuit breaker with an on/off switch is recommended in this motor connection for protection against shorts, motor failure and as a safety disconnect.

Many trolling motors draw current even when turned off, so the breaker should be switched off or the motor should be unplugged when not in use. The Trollbridge 12x24 draws no current when idle.

NOTE: No other connections should be made to this cable.

Trollbridge 12x24 Installation (Cont'd)



Not provided

16. OPTIONAL REMOTE INDICATOR

The amber LED on the Trollbridge 12x24 illuminates when the unit is in CHARGE Mode. You can install an optional remote indicator (not provided) to show when TROLLING Mode is active. Use any 12-Volt rated LED panel mount indicator and connect its black wire to the negative (-) terminal on Trolling Battery 1 (BLACK cable). Connect the red wire to the negative (-) terminal on Trolling Battery 2 (GREEN cable).



Not provided

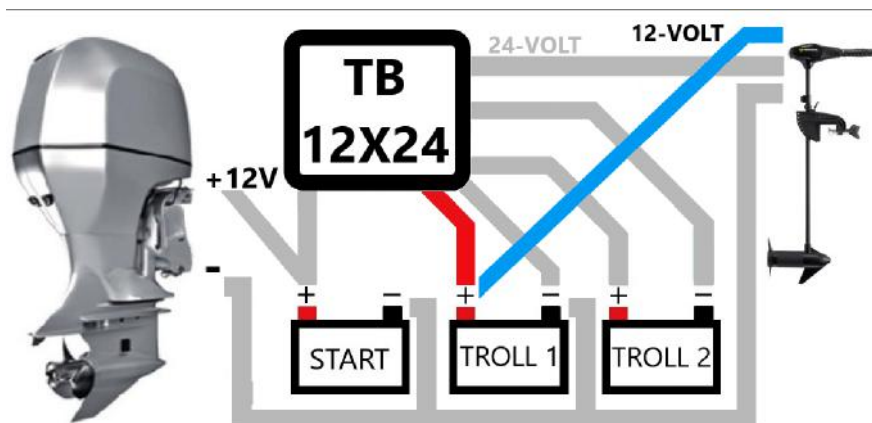
17. TROLLING MODE OVERRIDE SWITCH

An override switch is occasionally necessary for trolling motors that won't start up on 12-Volts. To install, connect an optional momentary (not provided) switch between the terminal post on the Trollbridge 12x24 and the positive (+) terminal of the Trolling Battery 1 (RED cable). Pressing the button activates Trolling Mode which will then continue operating until the trolling motor is turned off for thirty (30) seconds.

18. FOR 12/24-VOLT TROLLING MOTORS

12/24-Volt Trolling motors can be used with the Trollbridge 12x24. They will use both Trolling batteries in parallel for 12-Volts and in series for 24-Volt operation.

For ultimate protection and ABYC compliance, this wire should be fitted with a 60-Amp circuit breaker with an on/off switch and 100-Amp slow blow fuse. If fused, the RED cable must also be fused.



Troubleshooting

CHARGE MODE WON'T ACTIVATE

ARE THE CHARGING MODE CONDITIONS MET?

The Trollbridge 12x24 does not immediately switch from Trolling Mode into Charging Mode. There are two (2) criteria that must be met to switch back to Charge Mode. When a charging source is detected, the Starting battery must reach over 13-Volts for thirty (30) seconds. The total voltage of both (2) trolling batteries must also measure at least 20-Volts. Once these conditions are met, Charging Mode will be activated, and the green "CHARGING" LED will illuminate. These safety measures are in place to protect your starting battery and alternator from any bad batteries or wiring shorts.

DO YOU HAVE A BAD BATTERY?

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.

MANUAL OVERRIDE SWITCH FOR CHARGING MODE

Many trolling motors draw current even when turned off, and this current draw can prevent the Trollbridge 12x24 from automatically switching to CHARGE Mode. A 60-Amp circuit breaker with an on/off switch is recommended on the power supply line to the trolling motor. The breaker should be switched off or the motor should be unplugged when not in use.

Troubleshooting (Cont'd)

TROLLING MODE (+24V) WON'T ACTIVATE

DOUBLE CHECK YOUR WIRING

If you hear a buzzing sound from the Trollbridge 12x24 when activating your trolling motor, this indicates that one (1) of the batteries is not connected correctly.

IS YOUR TROLLING MOTOR ON?

The Trollbridge 12x24 automatically switches when it detects the load from the Trolling motor. Double check that the Trolling motor is on and connected properly to the BLUE wire from the Trollbridge 12x24 and to the negative (-) terminal of the Starting battery.

MANUAL OVERRIDE SWITCH FOR TROLLING MODE

If all the wiring is correct and the Trollbridge 12x24 still fails to switch to Trolling Mode (24-Volts) when you turn on your trolling motor this may indicate that the trolling motor electronics won't operate while in the 12-Volt mode. In this case, you will need to install a MANUAL CONTROL switch (not provided) that connects the short, light gauge YELLOW wire to the 12-Volt battery terminal that has the RED Trollbridge 12x24 cable on it. When the switch is turned ON this will activate Trolling Mode, otherwise Charge Mode will be active and only 12-Volts will be available to the Trolling motor. There will be a slight delay switching back to Charge Mode after turning the switch OFF. Light gauge wire is OK for the switch.

Troubleshooting (Cont'd)

WHAT IS THE NORMAL BATTERY VOLTAGE MEASUREMENTS?

You can check your battery voltages with a volt meter.

In Trolling Mode, the GREEN LED is ON. Check the wiring by putting the negative (-) meter lead on the BLACK cable connected to the Starting battery. You should measure +12-Volts on RED, +24-Volts on PURPLE (or WHITE).

LEAD-ACID – AGM – WET CELL BATTERIES

Starting Battery: RED-to-Black: +12-Volts or higher

Trolling Motor Battery: PURPLE (OR WHITE)-to-Black: +24-Volts or higher

LITHIUM BATTERIES

Starting Battery: Use Lead-Acid, AGM, or Wet-Cell batteries instead of Lithium batteries for the starting/cranking battery

Trolling Motor Battery: PURPLE (OR WHITE)-to-Black: +13.4-Volts or higher

In Charging Mode, the “CHARGING” LED is OFF. Check the wiring by putting the negative (-) meter lead on the BLACK cable. All battery positive (+) terminals should read nearly the same voltage as the starting battery (13.0 to 14.2 depending on state of charge.).

For Lead-Acid Batteries: +12.8-Volts or higher

For Lithium Batteries: +13.8-Volts or higher

Warranty Information

Limited One (1) Year Warranty

The Trollbridge 12x24 is warranted to the original purchaser against defects in material and workmanship appearing within one (1) year after the date of purchase. The unit will either be repaired or replaced, free of charge. Shipping charges will be the responsibility of the purchaser.

This limited warranty does not apply to chargers used commercially, nor does it cover normal wear and tear, blemishes that do not affect the operation of the charger, or damage caused by accidents, abuse, alteration, modification, misuse or improper care or maintenance. The cost of normal maintenance or replacement of parts which are not defective are the responsibility of the purchaser.

To obtain warranty service in the U.S., the charger and proof of original purchase with date, must be presented upon request. Labor to remove and replace the unit for warranty service, shipping, or any other similar items are the sole and exclusive responsibility of the original purchaser. Warranty service for the original purchaser can be arranged by contacting Tech Support.

There are no express warranties other than these limited warranties. No implied warranties, including any implied warranties of merchantability or fitness for a particular purpose, extend beyond one (1) year from the date of purchase. Incidental, consequential, or special damages are not covered under this limited warranty.

Voided Warranty

REMOVE EXISTING BATTERY JUMPERS PRIOR TO INSTALLATION

Your Trollbridge 12x24 unit can be destroyed due to faulty wiring connections during installation. We will not provide free replacements for damaged units due to installation errors. Because we understand that mistakes happen, we will warranty a unit that has been destroyed during installation, but there will be a charge of up to half the original purchase price plus shipping both ways to replace your unit.

IF TYPICAL EXISTING BATTERY JUMPERS ARE NOT DISCARDED THE Trollbridge 12x24 WILL SELF DESTRUCT AND VOID THE WARRANTY. Internal automatic switches in the Trollbridge 12x24 will take the place of these jumpers as it switches between series and parallel.

NOTE: SHORTENING ANY Trollbridge 12x24 SUPPLIED CABLES WILL VOID THE WARRANTY. Extending with 8- to 6-gauge wire is OK. Cutting off existing terminals to make extensions is OK.

Warranty Information (Cont'd)

Fuses And Circuit Breakers - **STRONGLY RECOMMENDED**

To avoid the risk of melted cables or fire you SHOULD install a circuit breaker, current rated for your trolling motor, on the positive connection to the trolling motor (Blue wire). We also recommend the installation of a 100 Amp in-line fuse on the Purple (or White) wire from the Trollbridge 12x24 unit to the positive post on each of the trolling motor batteries (+12V). An additional circuit breaker, rated at 100-Amps maximum, installed on the RED wire going to the Starting battery is recommended as well. These fuses and circuit breakers will help to protect against wiring errors during the installation. The recommended fuse holders and replacement fuses are available to purchase in the Accessories section of our website (SmartShoreMarine.com).

The positive feed to the trolling motor should always have a circuit breaker, 60-Amp rating is typical. For ultimate protection and ABYC compliance, the yellow, red, and purple/white wires to the battery positive (+) terminals could be fitted with disconnect switches and 100-Amp slow blow fuses. Many trolling motors draw current even when turned off, so the breaker should be switched off or the motor should be unplugged when not in use.

Technical Support

901.382.8888 Mon. - Fri. 8am - 5pm, Central Time

Email: Tech@SmartShoreMarine.com

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two (2) conditions: One (1) this device may not cause harmful interference, and two (2) this device must accept any interference received, including interference that may cause undesired operation.