

Selector Switch Issues

Battery Selector Switch



Figure 1: Battery Selector Switch

Battery selector switches like the one shown in Figure 1 allow the user to disconnect their starting battery during charging, connect their starting battery when they want to use their boat, jump start their starting battery by paralleling another battery to it, or run their boat off of that second battery.

In most selector switch installations the second battery will be one of the trolling motor batteries.

If wired correctly this is a perfectly acceptable accessory. If wired incorrectly this can be the source of serious electrical issues.

How the Switch Works

The switch has outputs that your outboard and 12 volt accessories should be connected to and 2 sets of inputs (one for each of the two batteries that are to be used). Internally the negatives or black wires are **always** connected to each other; the switch only switches the positive or red wires. When in the OFF/CHARGE position no red wire connections are made. In the ON/RUN position the positive wire from the input is connected to the output. In the JUMP START position the positives from both batteries are connected to the output (and each other). In the BATT 2 ONLY position the positive from the second battery is connected to the output.

Correct Wiring

If the low side trolling motor battery is used as battery 2 for the selector switch this will not cause any issues. The diagram to the right shows a switch wired correctly.

There is no voltage potential between the trolling motor case and the outboard case.

Figure 2 diagrams a correctly wired boat.

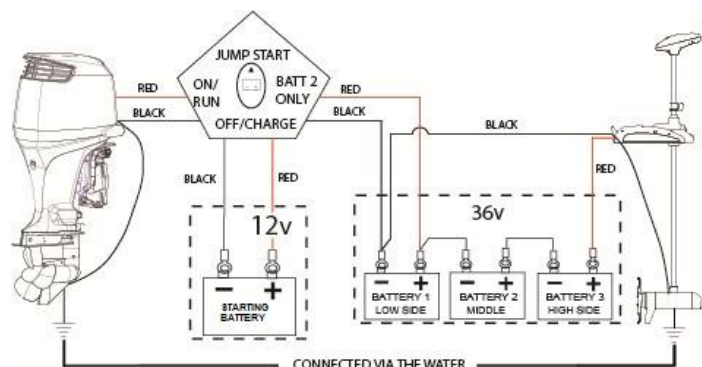


Figure 2: Correct Boat Wiring

Incorrect Wiring

If the middle or high side trolling motor batteries are used as the second battery this will cause issues. Using one of these two batteries creates a voltage potential between the trolling motor lower unit and the outboard case of either 12 or 24 volts, depending on which of the batteries is used. With this voltage potential present electrons will move from the trolling motor lower unit to the outboard lower

unit or other grounded items below the water line; these electrons carry aluminum molecules with them causing rapid corrosion of the trolling motor lower unit, this corrosion is called electrolysis. Figures 3 and 4 diagram the incorrect wiring of the switch.

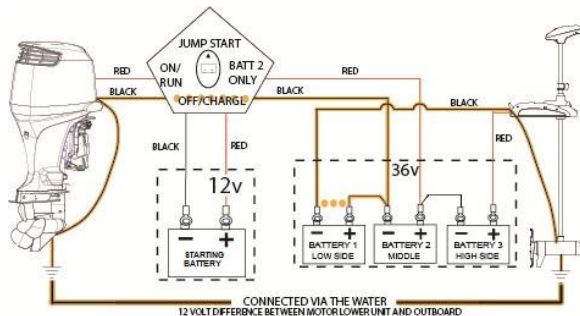


Figure 3: Switch Wired to Middle Trolling Motor Battery

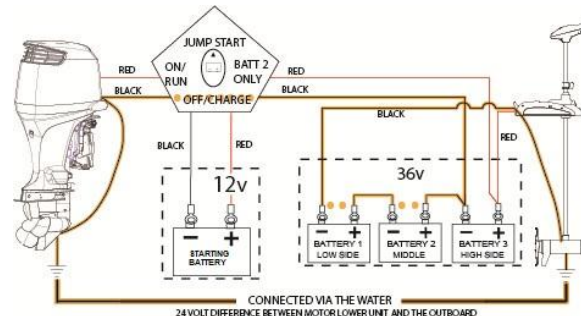


Figure 4: Switch Wired to High Side Trolling Motor Battery

Bonding Wire Fuse

The bonding wire to the lower unit on the trolling motor has a 3 amp fuse in line; if the current exceeds 3 amps the fuse will be blown and this will end any issues directly related to the bonding wire. Since the bonding wire is there to prevent depth finder interference you will likely see depth finder interference after the fuse has blown. The electrolysis process happens at less than three amps; a blown fuse indicates the batteries were connected in “Jump Start Mode” or some other powered connection was made (like powering a depth finder or other accessory from the middle or high side battery that is also connected to starting battery ground).

Electrolysis

As mentioned above electrolysis is corrosion caused by the flow of DC electric current through water. Compared to other forms of corrosion, electrolysis is quicker; signs of corrosion will usually show up within a couple hours of use. Typical signs of electrolysis are a white powder on aluminum parts, especially at seams or sharp corners, or the actual loss of metal. Figure 5 is an extreme example of electrolysis; this example includes the loss of metal.



Figure 5: Example of Electrolysis