U.S.C.G. Electrical Standards & Wiring Diagrams

On January 31, 1977 the U.S.C.G. Published Safety Standards for Marine Electrical Systems. These Standards Cover Such Technical Details As:

- Batteries and Associated Conductors
- Conductor Size and Ampacity
- Strain Relief and Pull Tests
- Termination Requirements
- Overcurrent Protection
- Ignition Protection
- Grounding
- Insulation

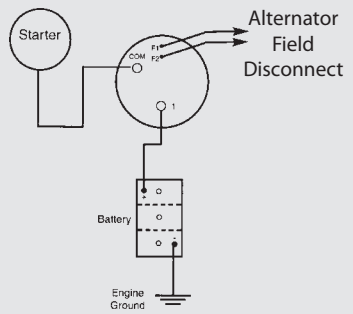
A particular electrical component may be affected by some or all of the above categories. Those categories related to product design have been complied with, however, many additional details must be considered by the installer of the equipment as well in order to achieve compliance with this standard. It is suggested that the actual standard be familiarized when installing equipment. Perhaps one of the most critical requirements is ignition protection. A product that is marked "Ignition Protected" can be used in that area of a boat that is not isolated from a gasoline fuel vapor source. Refer to the actual standard for a determination of what parts of a boat require Ignition Protected products.

If a product is not plainly marked "Ignition Protected" then assume it is not.

For Details On All Of The Above, Obtain The Following: U.S.C.G. Safety Standards For Electrical Systems CFR Title 33, Chapter 1, Subchapter S, Part 183, Subpart I

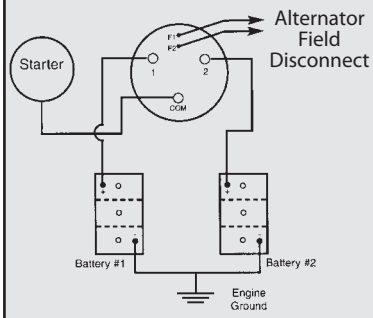
Typical Battery Switch Wiring Diagrams

Diagram #1



SINGLE ENGINE
SINGLE BATTERY

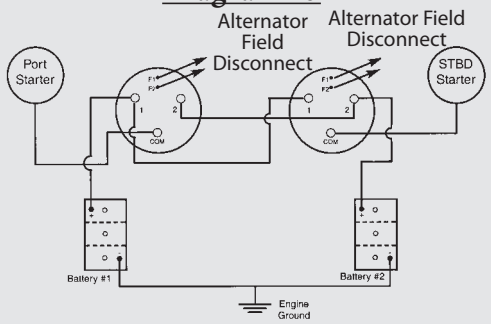
Diagram #2



SINGLE ENGINE
TWO BATTERIES

Switch Position indicates which battery (#1, All, #2) is connected to engine.

Diagram #3

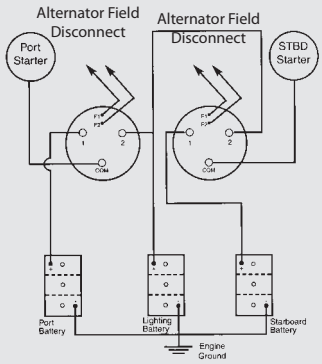


2 ENGINES, 2 BATTERIES, 2 SWITCHES.

This allows either engine to be started by either battery.

Port switch indicates which battery (#1, All, #2) is connected to the port engine and the starboard switch indicates which battery (#1, All, #2) is connected to starboard engine.

Diagram #4



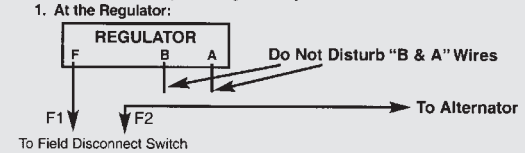
2 ENGINES, 2 ENGINE BATTERIES,
1 SEPARATE BANK OF LIGHTING BATTERIES
AND 2 SWITCHES

This allows both engines to be used to charge Lighting Batteries.

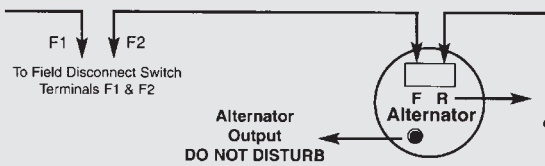
Port switch indicates which battery (port only, port lighting only) is connected to the port engine and the starboard switch indicates which battery (starboard only, starboard lighting only) is connected to starboard engine.

Optional Alternator Field Disconnect

A. Use minimum 14 awg wire, suitable for use in marine engine compartments.
B. On systems with separate regulator, splice the field disconnect switch into the field wire "F" as shown:
1. At the Regulator:



2. On unitized alternators with built-in regulator and 3 wire hook-up, splice the field disconnect switch into the field wire "F" as shown"



C. On single wire alternators - a field disconnect cannot be installed.

Battery Switch Technical Information - How to Use PERKO Battery Switches

Using Perko Battery On-Off Switches

There are many ways to use a Perko Battery On-Off Switch. The most obvious (and most common) is simply to use it to turn off your battery when in storage so that your battery does not drain as quickly and is ready to go when you are. Like all Perko products, these time-proven switches are made in the USA . All switches are ignition protected.

But for boats with multiple engines and multiple batteries, using multiple on-off switches (sometimes in conjunction with a selector switch) can provide different benefits.

Example 1: Running with a selector switch in the both position (see selector switches) may not fully charge all batteries. But adding on-off switches to the circuit you can force the alternator to charge the battery you want charged.

If you have any questions or doubt about how to use, install or wire any battery switch, consult a certified marine electrician.

Battery disconnect switches help manage the overall use of electrical power onboard. They are used to connect or disconnect electrical devices from the electrical system. They help to prevent battery drain during periods of inactivity. They allow for a quick and easy way to shut down the entire electrical system in an emergency. An optional key lock helps to prevent unauthorized use of the vessel.

Perko battery switches are designed for surface mounting. Standard duty disconnect switches have bright red polycarbonate reinforced housings for safety with large easy-to-turn black knobs. The housing of the heavy duty switches are red fiber-reinforced polycarbonate.

Models with an “Alternator Field Disconnect” feature offer protection for Non-Unitized Alternators should the switch accidentally be turned to the “OFF” position with the engine running.

High conductivity studs are long enough to handle more than 1 cable and strong enough for torque needed for secure connections. Optional spacer ring (PN 0462DP0RED) allows for the use of larger cables.

Medium Duty Disconnect Switches.

Figs. 9601-9604 Series:
On-off switches are among the most popular battery switches ever produced. Their traditional Perko bolt circle makes for easy installation. These switches can be mounted in numerous locations, and as ignition protected switches, they can be installed in the engine rooms of gasoline powered boats.

Versions of this series of switches offer additional features such as alternator disconnect and key lock security.

Compact Disconnect Switches.

Figs. 9611 and 9612 Series:
These on-off switches use the same traditional Perko footprint as the 9601-9604 Series. This makes for easy installation. These switches can be mounted in numerous locations. And as ignition protected switches, they can be installed in the engine rooms of gasoline powered boats.

Versions of the 9611 series of switches offer additional features such as alternator disconnect and key lock security.

Four removable skirt panels allow for easy cable connection from different directions. High conductivity studs are long enough to handle more than 1 cable and strong enough for torque needed for secure connections.

New Concept Disconnect Switches.

Fig. 9621 Series:
These on-off switches offer a completely new approach to battery switches for small boats not normally equipped with the ability to shut off the electrical system. Their primary purpose is to prevent battery drain during regular periods of normal non-use.

An entirely new mounting system (designed specifically for small boats) makes these switches simple to install and to access on boats with limited space and low amperage draws. Simply cut a 3" hole, install the cup mounted switch with 4 screws, attach the cables and you're off. The integral lid closes flush to the mounting surface, protects the switch from the elements and provides a clean, professional look. To turn on or off, simply open the lid, turn the easy to hold key, and close the lid. No more dead battery.

Other series features include ignition protection, white or black mounting cups, panel and bulkhead mount options and a large plastic key that is retained or can be easily removed to prevent accidental actuation. A selector version (8521DP) is also available.

Heavy Duty Disconnect Switches

Fig. 9703 Series:
On-off switches are among the most popular heavy duty battery switches ever produced. Their use of the traditional Perko bolt circle makes for easy installation, whether new or as a replacement. These switches can be mounted in numerous locations, and as ignition protected switches, they can be installed in the engine rooms of gasoline powered boats.

These heavy duty switches are rated at up to 450 amps continuous and 1,200 amps intermittent (see specifications). An alternator field disconnect feature is standard.

High conductivity studs are long enough to handle more than 1 cable and strong enough for torque needed for secure connections.

Using Perko Battery Selector Switches.

There are many ways to use a Perko battery selector switch. Here is a simple way to think of the most common use.

Perko battery switches are designed for surface mounting and have bright red polycarbonate reinforced housings for safety with large easy-to-turn black knobs. Selector switches are designed with a "make before break" feature. This allows switching between the "1", the "ALL" and the "2" positions while the engine is running and the switches are ignition protected.

You always want to have enough power to start your engine to go back to shore. This begins by never leaving the dock without 2 fully charged batteries. For each trip, select one battery that you will use for your engine only for that day. Set the switch to that position (either “1” or “2”), start your engine and head out. Once there, shut off your engine and change the switch to the other position to run your accessories off the other battery. You can start and stop your engine as need be as you spend the day on the water.

Battery selector switches allow you to do everything a battery disconnect switch does and in addition they permit battery selection (of two or more batteries) for specific purposes including starting engines, running accessories or even recharging. They allow for the use of one or more batteries in

Battery Switch Technical Information - How to Use PERKO Battery Switches

systems with one or more engines and facilitate putting batteries in parallel for emergency starting when one or both batteries are substantially discharged.

When you're done for the day, start your engine and head home. You will recharge that battery on your way back. But if you happened to drain it too much to start the engine, then just change the switch position to the other battery that is fully charged and you're on your way.

The "both" positions can be used in the event neither battery has enough power to start your engine. In this case using two badly discharged batteries together just may provide enough power to start. Note that running in the "both" position may not fully recharge both batteries. Recharging is best done with the switch set to either the 1 or 2 position. Once back at the dock, turn the switch to the "off" position to prevent either battery from draining while in storage.

High conductivity studs are long enough to handle more than 1 cable and strong enough for torque needed for secure connections. Optional spacer ring (PN 0462DP0RED) allows for the use of larger cables.

Always consult a certified marine electrician if you have any questions or doubt about how to use, install or wire any battery switch.

Medium Duty Selector Switches

Figs. 8501-8504 Series:
This series of battery selector switches are among the most popular battery switches ever produced. Their use of the traditional Perko bolt circle makes for easy installation, whether new or as a replacement. These switches can be mounted in numerous locations and positions, and as ignition protected switches, they can be installed in the engine rooms of gasoline powered boats.

In addition to doing everything a battery disconnect switch does, battery selector switches permit battery selection (of two or more batteries) for specific purposes including starting engines, running accessories or even recharging. They allow for the use of one or more batteries in systems with one or more engines and facilitate putting batteries in parallel for emergency starting when one or both batteries are substantially discharged.

Versions of the 8501 Series switches offer additional features such as alternator disconnect and key lock security.

The 90° rotation feature allows users to feel the switches' position in no light situations and the classic shape of the knob makes it easy to turn.

Compact Selector Switches

Figs. 8511 and 8512 Series:
Compact battery selector switches use the same traditional Perko bolt pattern as the 8501 series but with a smaller footprint. This makes for easy installation. These switches can be mounted in numerous locations and positions, and as ignition protected switches, they can be installed in the engine rooms of gasoline powered boats.

Versions of the 8511 series switches offer additional features such as alternator disconnect and key lock security.

Four removable skirt panels allow for easy cable connection from different directions. High conductivity studs are long enough to handle more than 1 cable and strong enough for torque needed for secure connections.

New Concept Selector Switch.

Fig. 8521 Series:
These small selector switches offer a completely new approach to battery switches for small boats not normally equipped with the ability to shut off the electrical system. Their primary purpose is to prevent battery drain during regular periods of normal non-use. This selector version offers the option of adding a second battery to the system.

An entirely new mounting system (designed specifically for small boats) makes these switches simple to install and to access on boats with limited space and low amperage draws. Simply cut a 4" hole, install the cup mounted switch with 4 screws, attach the cables and you're off. The integral lid closes flush to the mounting surface, protects the switch from the elements and provides a clean, professional look. To turn on or off, simply open the lid, turn the easy to hold key and close the lid. No more dead battery.

Other series features include ignition protection, white or black mounting cups, panel and bulkhead mount options and a large plastic key that is retained or can be easily removed to prevent accidental actuation. An on-off version (9621DP) is also available.

Heavy Duty Selector Switches

Fig. 8603 Series:
Perko 8603 battery selector switches are among the most popular heavy duty battery switches ever produced. Their use of the traditional Perko bolt circle makes for easy installation, whether new or as a replacement. These switches can be mounted in numerous locations, and as ignition protected switches, they can be installed in the engine rooms of gasoline powered boats.

These heavy duty switches are rated at up to 380 amps continuous and 850 amps intermittent (see specifications). An alternator field disconnect feature is standard. The 90º rotation feature of the knob allows users to feel the switches' position in no light situations, and the classic shape of the knob makes it easy to turn.

Using Perko Cup Mount Battery Switches.

Perko's new "cup mount" system offers an entirely new approach to battery switch installations and gives owners of small boats an easy way to reduce the likelihood of a dead battery. Designed primarily for smaller boats with limited mounting location options, these switches offer an entirely new approach to battery switch installation. They let you mount a switch in places not normally thought of for switch installation like:

- On the side of center consoles
- Under seats
- Against exposed bulkheads

Switches are flush mounted on the surface with no petrusions to bump against and protected from the elements by a simple to open and close cover while the inner workings remain safely inside a compartment.

The cup mount switches are easy to install and simple to access while remaining completely out of the way.