Application Brief - DC Digital Meter

Typical (Traditional) Two Battery System with Wiring for Digital Meter

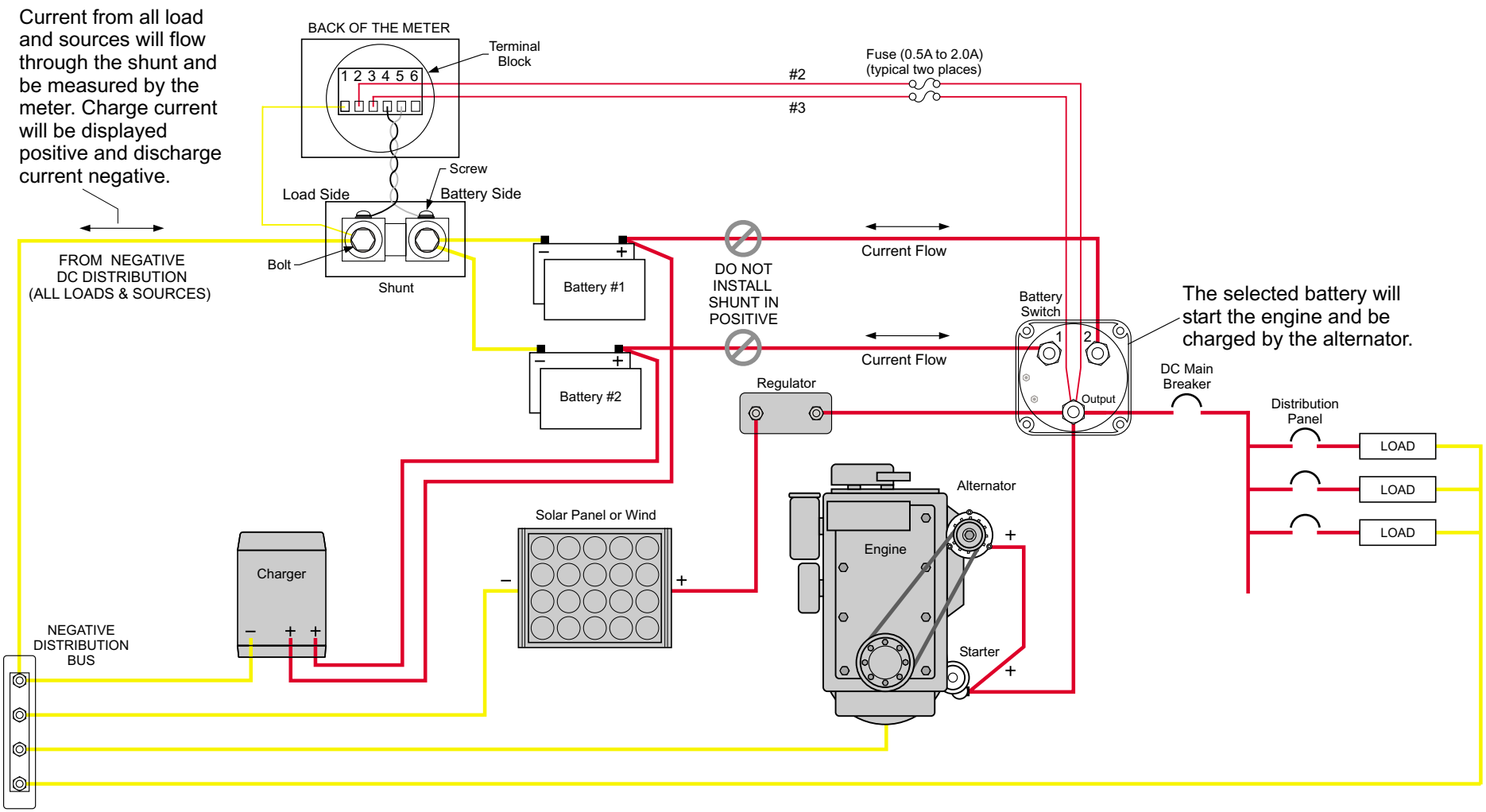
The typical marine system with two batteries and a battery switch, which selects Battery #1, Battery #2, or both batteries, is illustrated in the drawing. The shunt, which allows the digital meter to measure the current flow in and out of the battery, is shown installed in the negative of the two batteries. Note that the negative of the two batteries connects to the big bolt on one side of the shunt and all loads and sources connect to the other side of the shunt. The shunt must be installed in the negative. The meter will be damaged if it is installed in the positive side of the system.

The current flow can be traced out of the battery, or batteries selected by the battery switch, through the switch and to the distribution system, and then through the load. From there it flows to the negative bus and then to the load side of the shunt, through the shunt, and finally returns to the battery. If the current flow is due to consumption it will be displayed as a negative number.

If we similarly trace the current flow from the engine alternator we see that it flows out of the alternator to the battery switch, where it splits and the current necessary to supply the loads flows to the distribution panel and returns via the negative bus to the alternator. Thus, the distribution current is not measured. The current necessary to charge the battery, however, flows from through the battery switch and to the battery selected by it. This charging current then flows through the battery and then the shunt, where it is measured, and finally returns to the alternator/engine via the negative bus. This charging current is displayed as a positive number.

We can also trace out the current flow from the alternative energy sources or the battery charger and can see that the same is true. Current necessary for the distribution system flows directly to it but charging current flows through the shunt and is measured by the meter.

Please also note that Wires #2 & #3 are connected to the common of the battery switch. This means that the meter will be off when the battery switch is off and that the voltage of the selected battery is displayed.

This wiring diagram is only one example of how to install and wire a system. Many variations are possible. For example, one can install a switch in the voltage sensing lead, Wire #3, and use it to select multiple battery voltages to be displayed. In this way three of more battery voltage can be monitored.

Typical (Traditional) Two Battery System