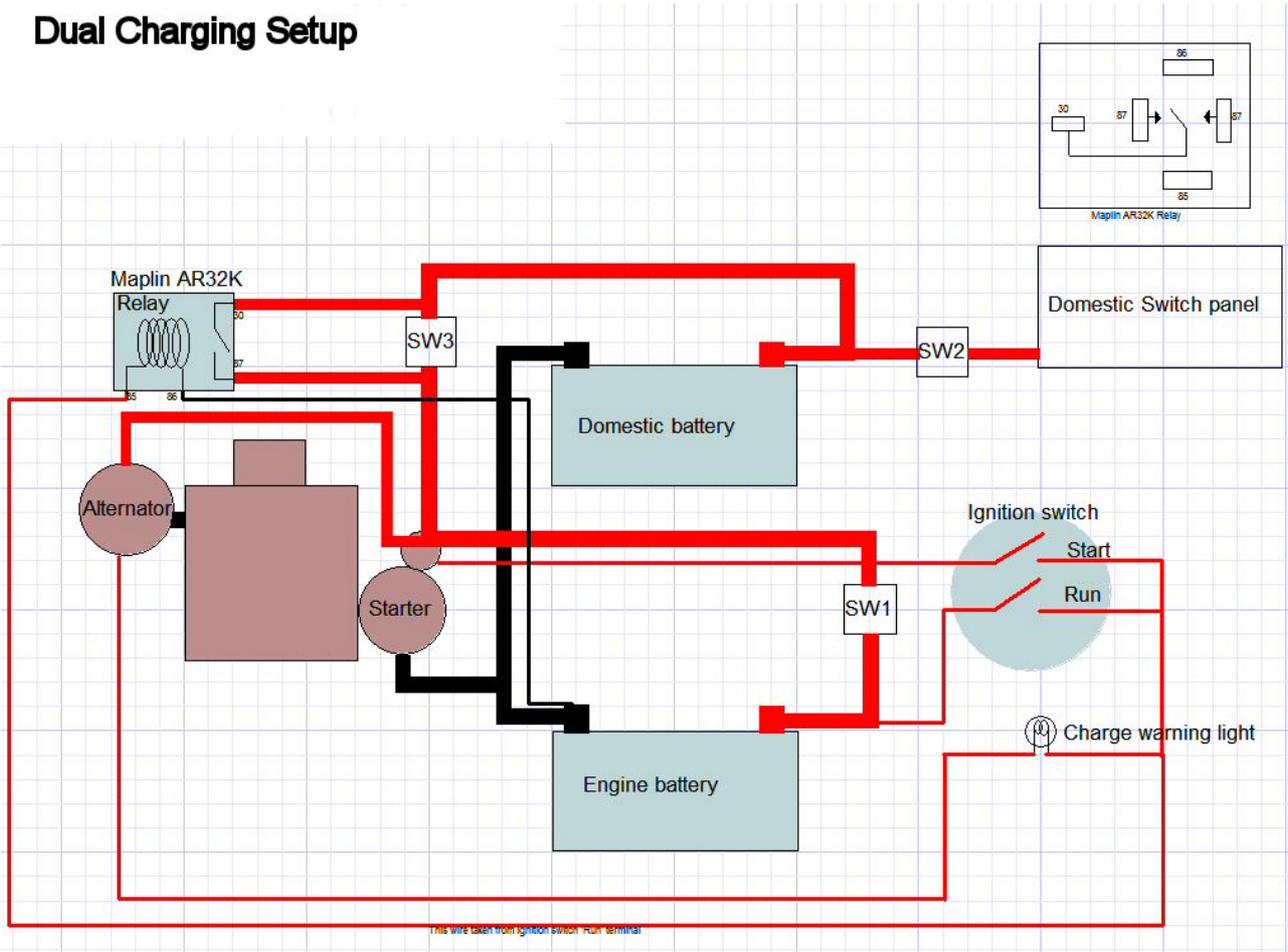


# Split Charging

On our boat we have two 12V batteries. In the main, we try to use one for engine starting and the other to power all the other electrics; lights, instruments, radios etc. Both of the batteries require regular charging but we don't want them permanently connected together because there is the possibility of both becoming discharged by the 'house' electrics, there would then be no way of starting the engine to re-charge.

The following diagram shows how the system ended up being wired. Please note that this is not quite the conventional way of doing things, see the notes later in the document for an explanation of how it was originally intended to work..

## Dual Charging Setup



### How it works.

SW1, SW2 and SW3 are conventional high current battery On/Off switches. When we are on the boat SW1 and SW2 are turned ON. SW3 is normally OFF.

When the ignition key is turned to the Start or Run position, 12Volts is applied to the coil of the relay which causes it to close its contacts. This effectively puts the two batteries in parallel. So when the engine starts and is running, both batteries are in parallel and both batteries are being charged.

When the engine is stopped and the ignition key is turned to OFF, the 12Volts is removed from the coil of the relay and it opens its contacts. This separates the batteries and ensures that only the domestic battery is used to power the domestic switch panel.

The relay can be overridden and the batteries paralleled by turning SW3 ON.

### ***How it was intended to work***

A more conventional way of wiring this type of system (and, if it works, a better way) is to power the relay coil from the alternator terminal for the charging lamp, NOT from the ignition switch.

This would mean that the batteries are not paralleled until the alternator is actually charging i.e. the engine has started.

### ***What the difference in wiring means***

The way we currently have the system wired means that as soon as the ignition key is turned, the two batteries are paralleled. So, when we start the engine, both batteries are providing the current. This could, theoretically, cause a problem if one of the batteries were completely flat; it may pull the combined voltage of the batteries too low to start the engine. The only way to cure that problem would be to, temporarily, physically disconnect the flat battery while the engine is started.

### ***An easier, but more expensive, system***

An easier, but more expensive, way of achieving a similar result is to use a Voltage Sensing Relay (VSR). Google for details.

The benefits are the same as a normal relay except that, with a VSR, the engine start battery is brought back to full charge before the house battery starts to charge.

### ***What it's all attached to***

The system is attached to the 40A alternator on our Beta BZ482 engine. We have two 100Ah lead acid batteries.