

HOW TO CONNECT BATTERY ISOLATORS



The Guest Co.

1. INTRODUCTION

The isolators are connected between the alternator(s) and the batteries. The difficulty in connecting isolators is due to the large variety of alternators/regulators. Although there are specific terminals (wires) involved in such connections, the alternators/regulators come in many different configurations and, furthermore, new configurations are introduced every year. This makes it difficult to generate diagrams that will cover every configuration.

The following attempts to identify the pertinent terminals (wires) of the alternator/regulator and to show how the isolator interfaces between these terminals and batteries.

SAVE THESE INSTRUCTIONS

2. PERTINENT TERMINALS / WIRES

- A. DC Output. This terminal supplies a positive DC voltage of approximately +14.5V and it is used to charge the battery(s). The wires connected to it vary in color (red, orange, purple, etc.), but they are heavier gauged than the wires connected to the other terminals.
- B. AC Output. There are two AC terminals (wires). They supply a square wave voltage with approximately 50% duty cycle and amplitude of +14.5V (i.e. Half the time the output is +14.5V and Half the time is 0 Volts). Because the voltage is only half the time on, a DC voltmeter will usually read approximately +7 volts. One of the two outputs is often used as the input to the tachometer. The two AC output wires are of the same color (yellow, green, etc.) and not connected to the same point of the terminal strip.
- C. Sense. This terminal (wire) is used to protect the batteries from being overcharged. In essence this terminal is connected to the positive part of the battery and monitors its voltage value. When the battery is fully charged, the regulator turns off. When the battery voltage drains down, the regulator turns on and the battery is charged again. Usually the wire connected to the sense terminal is the same color as the DC output wire but of lighter gauge. Not all alternators/regulators have a dedicated sense terminal (wire). Some use the DC output terminal to perform the sense function.

In many cases there are more Terminals/Wires from or to the alternator/regulator. They are not pertinent to isolator interface and should not be disturbed.

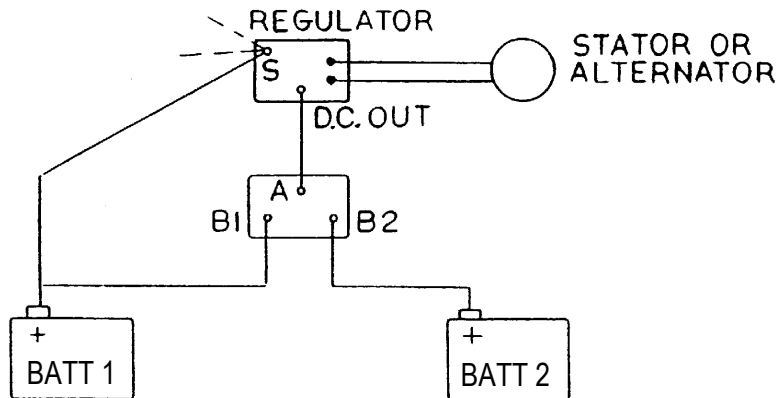
In general there are two major alternator/regulator configurations.

*Alternators with external regulators, found mostly on outboard engines and,

*Alternators with internal regulators, found mostly on inboard and I/O engines.

3. Wiring Isolators to engines with external regulators and dedicated sense wire.

The isolator is connected between the DC output terminal of the regulator and batteries as shown in the diagram.



The sense wire is connected directly to the battery and it should not be disturbed. To interface the isolator, disconnect the DC output from the terminal strip of the regulator and connect it to the B1 terminal of the isolator. Using #8 gauge wire connect the A terminal of the isolator to the recently vacated DC output location on the terminal strip of the regulator.

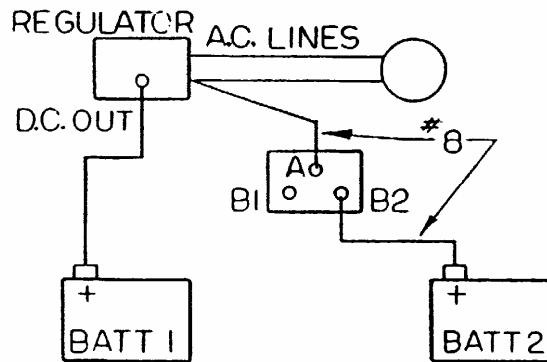
Using #8 gauge wire connect terminal B2 of the isolator to the positive post of the second battery.

NOTE: On some regulators, one or more wires of the same color are connected to the sense wire. KEEP ALL THESE WIRES TOGETHER.

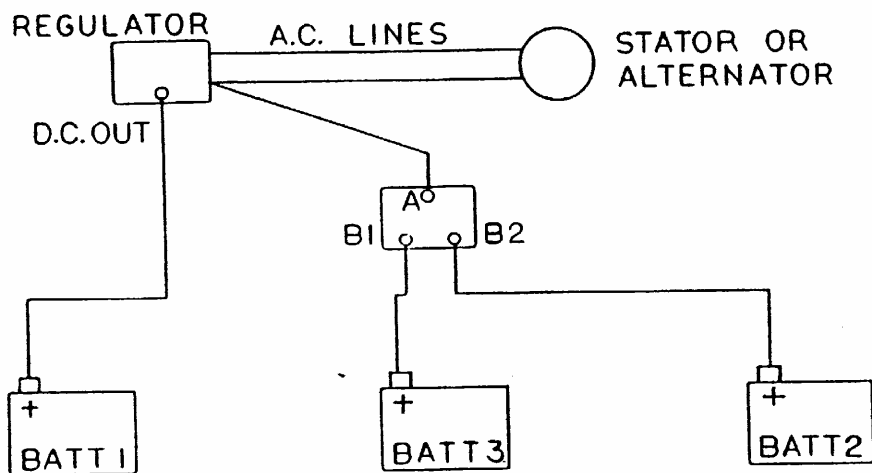
4. Wiring Isolators to engines with external regulator and without dedicated sense wire.

This type of regulator uses the DC output to sense the status of the battery. The isolator cannot be interfaced between the DC output and the battery because the sense function will be disabled.

In this case the charging voltage through the isolator is tapped at one of the two AC Terminals of the regulator.

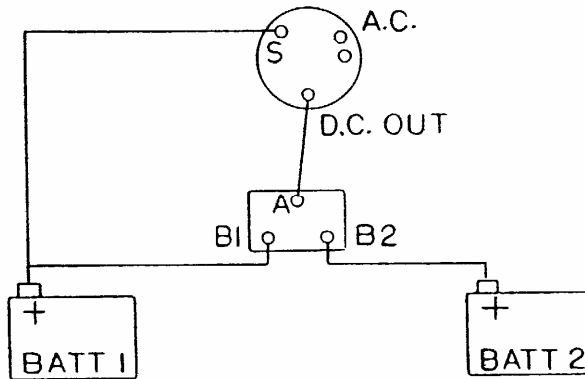


If there is a third battery it can be connected to the B1 terminal of the isolator as shown below.



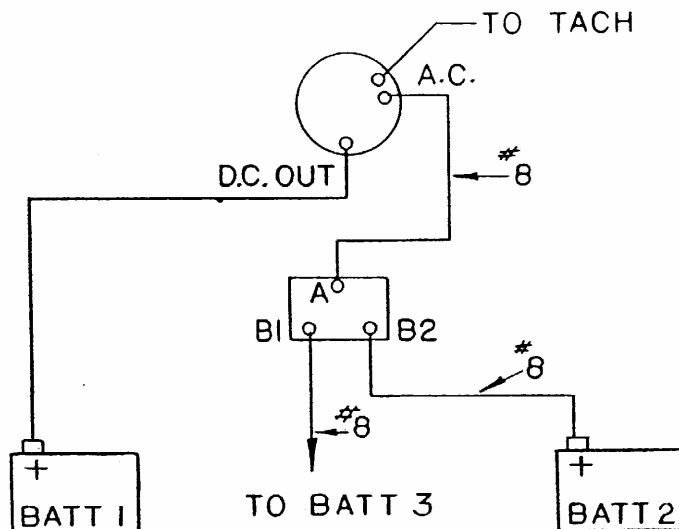
5. Wiring Isolators to alternators with internal regulators and dedicated Sense terminal.

This configuration is similar to #3. The sense wire should not be disconnected and the isolator is inserted between the DC output of the alternator and the batteries as shown below:



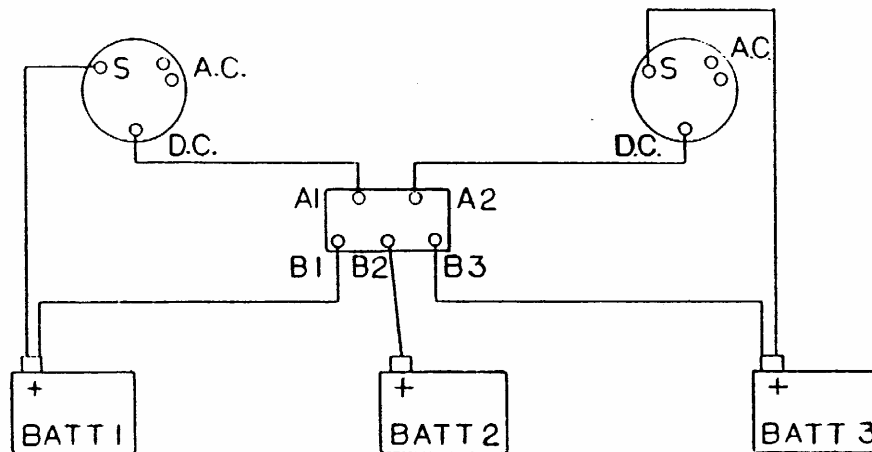
6. Wiring Isolators to alternators with internal regulators and without dedicated sense terminal.

This configuration is similar to #4. The DC output wire should not be disconnected and the charging voltage is taken from one of the AC terminals, as shown below:



7. TWIN ENGINE CONFIGURATION

For this configuration an isolator with two A terminals is required. Each A terminal is connected to one alternator/regulator in the same way described previously. In the following example the alternator has a built in the regulator and dedicated sense wire.



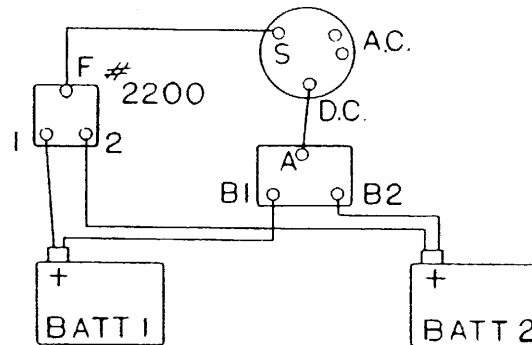
8. SHORT COMINGS:

When one alternator/regulator charges more than one battery but Senses the status of only one battery there are two shortcomings. Assume that the regulator senses BATT 1 and BATT 2.

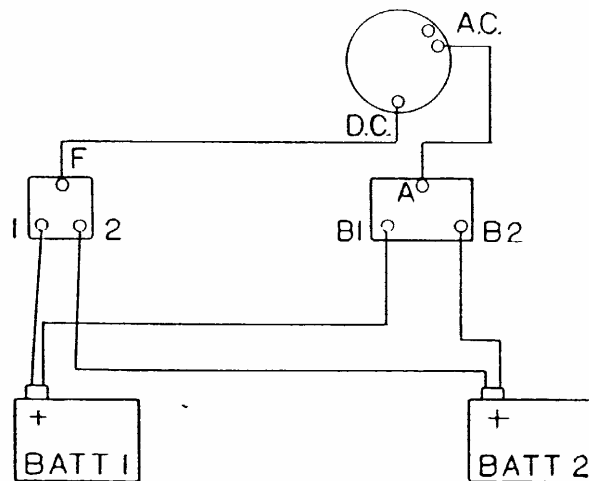
- A. If BATT 1 is not fully charged, the regulator will not supply charging energy to both batteries thus BATT 2 is being charged whether it needs it or not. This situation may cause overcharging of BATT 2.
- B. If BATT 1 is fully charged the regulator will not supply charging power to either battery. Thus BATT 2 will not be charged even if it may need to. This situation is very probable when BATT 2 is used for the Accessories and BATT 1 is used to start the engine. During cruising both batteries get charged but, only one battery (BATT 2) is being drained by the accessories. As soon as BATT 1 is fully charged the regulator turns off the charging power, and BATT 2 continues to drain out.

9. SOLUTION:

The solution to the above shortcoming is to be able to switch the sense terminal from one battery to another. The most appropriate switch to be used is the Smart Switch Guest Model #2200. The Smart Switch has a built in digital voltmeter so the status of each battery can be monitored. Two wiring configurations (alternators with and without dedicated sense wire) are shown below:



Alternators with dedicated Sense Terminals.



Alternators without dedicated Sense Terminals.

During cruising, the status of each battery is checked, and the switch is left in the position where the battery is lower.

LIMITED WARRANTY

For one (1) year from the date of original purchase, The Guest Co. will at its discretion repair or replace for the original consumer, free of charge, any parts found defective in material or workmanship. All transportation charges under this warranty must be borne by the consumer.

Proof of Purchase is required. A computerized register receipt is required. Hand written receipts are not accepted for warranty proof of purchase. In the absence of a receipt, warranty period will be calculated from date of manufacture printed or stamped on the product.

There is no other expressed warranty. Implied warranties, including those of merchantability and fitness for a particular purpose, are limited to one year from date of purchase. This is the exclusive remedy, and consequential damages are excluded where permitted by law.

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