

QUALITY MARINE TECHNICAL BULLETIN, 01-2

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RE: Boats (Sea Rays) using VMI multiple outputs to 2 battery banks, 1 house, 1 start.

USE OF MULTIPLE OUTPUTS FROM A REGULATED CHARGING

SOURCE: When the fundamentals of correct battery charging and maintenance are taken into account, using multi-outputs from a charging device is a compromise at best. In fact, the better the regulator on the charging device, the poorer the result. If the multi-outputs of the charger are connected to battery banks where loads are balanced or, to 2 or 3 start battery banks with no connected house loads, the results are quit good. However, when the charger is connected to a start bank and a dynamically loaded house bank, results usually do not meet expectations.

PROBLEM: VMIs employ a +- 1/2 of 1% voltage regulator. That's as good as it gets. When connecting a VMI to a start battery and a dynamically loaded house bank, users expect that the VMI is capable of regulating the 2, sometimes 3, battery banks separately. Remember, there is only one regulator in the charger. When substantial load is placed on one bank, voltage of that bank drops, the charger energizes to keep voltage within 1%. The majority of current goes to lower resistance, i.e. load. However, some current flows to the unloaded start battery. While low, that current causes the start battery voltage to rise. Logic tells us, the house battery voltage must drop the same percentage as the start battery rises to satisfy the 1% regulator. Across time, the start battery retards support to house loads. Given enough time (days), continuous house loads cause the start battery to gas and the house battery to slowly discharge. Switching loads daily from one bank to the other alleviates this problem if one remembers to do so. However, this method still results in alternating shallow cycles of both batteries. There is a better way.

SOLUTION:

If possible, designate one battery bank for starting of both engines. That way, the house bank can be built larger; large enough to really cope with the house demand. Disconnect the VMI charger from the start bank, allowing the VMI regulation and auto recharge feature to attend to the cycled house bank where it is needed. Next, install a manual parallel lead with on/off switch between the positive poles of the house and start bank (ground should be common). If a momentary solenoid paralleling connection exists, install the manual switch across the 2 connecting lugs of the solenoid switch. During the regular boating season (when the boat is being used 3 or 4 times a month), the manual switch stays in the "off" position. During lay up or liveaboard periods when the engines seldom run, close the switch to the "on" position. Now, the VMI sees the house and start batteries as one, maintaining proper float of all batteries while precisely regulating to load. The batteries enjoy "constant float voltage" regardless of load. When boating resumes, open the switch. The batteries are ready. Questions: Call Quality Marine: 1-800-463-5314.