



CDI P/N: 194-9502-4

# Installation and Troubleshooting Guide

All rights reserved. Reproduction or use of content, in any manner, without express written permission by CDI Electronics, Inc., is prohibited.

## Voltage Regulator/Rectifiers for Mercruiser Engines

**NOTICE!** This product is designed to be installed by a professional marine mechanic. CDI Electronics cannot be held liable for injury or damage resulting from improper installation, abuse, neglect or misuse of this product.

**DO NOT USE A MAINTAINENCE FREE, AGM OR DRY CELL BATTERY WITH THIS TYPE REGULATOR/RECTIFIER!!!**

**WARNING!!! NEVER DISCONNECT THE BATTERY WHILE THE ENGINE IS RUNNING AS THIS WILL BURN OUT THE REGULATOR/RECTIFIER.**

***If the boat is equipped with a battery switch, make sure that it is a make before break type.***

1. Disconnect the battery and all wires from the regulator/rectifier.
2. Remove the old rectifier/regulator.
3. Thoroughly clean all ground connections and regulator mounting area.
4. Install the new regulator.
5. Reconnect all wires except the battery cables as follows:

Regulator	Harness
Yellow	Yellow
Yellow	Yellow/Gray
Red	Battery terminal of starter solenoid
Purple	Connect to key controlled 12V (Usually located at the choke solenoid.)
Black wire	Engine ground
No Connection	Red & Red/White or Orange (Tape off or remove)

6. Reconnect the battery.

### TROUBLESHOOTING

Recommended tools:

Fluke multimeter with DVA adapter (CDI 511-9773NL)

Piercing probes (CDI 511-9770)

Load bank

1. With all wires connected and the engine running at approximately 1500 RPM, check the DVA voltage from each yellow wire to engine ground. The two readings have to be within 2 volts of each other (i.e. if one is reading 20 volts, the other has to read between 18 and 22 volts). If the readings are not equal, go to step 3. If equal, go to step 2.
2. Check the DVA voltage from the yellow wires to the red wire going to the solenoid. The two readings must be within 2 volts of each other. If the readings are unequal, go to step 3. If they are equal on this step and step 1, the rectifier/regulator and battery charging portion of the stator are OK.
3. If the readings are unequal, mark across the connection between the stator and rectifier on the low side. Turn the engine off and swap the stator leads. Crank the engine up and retest. The component that has the marked wire with the low reading is bad.

### Checking maximum output

1. Install an amp meter capable of reading the maximum output in line on the red wire connected to the starter solenoid.
2. Connect a load bank to the battery.
3. In the water or on a Dynamometer, start the engine and bring the RPM up to approximately 3000.
4. Turn on the load bank switches to increase the battery load to match the rated output of the stator.
5. Check the amp meter.
6. If the amperage is low,
  - A) Check the purple wire for voltage while the engine is running. You should see the same voltage as the battery.
  - B) Connect a jumper wire from the Positive battery cable to the purple wire and recheck the amp meter. If the amperage is now correct, there is a problem in the harness or key-switch.
7. If the amperage is correct, but the battery voltage remains low, replace the battery.

### Bench test

- A) Diode plate check:** Test the forward diodes between the two yellow wires and the red wire just like you would on a regular rectifier. You should get a reading one way but not the other. Check the resistance from each yellow wire to case ground, you should have a high reading, typically in the M range. The red wire should not read to ground or show a very high reading, 25 M ohms or more.
- B) Tachometer Circuit:** Check ohms resistance between the gray wire and engine ground. You should read approximately 10K (10,000) ohms. Gray to red, and gray to the yellow wires should be a high reading, usually in the M range.

Thank you for using CDI Electronics

11/18/2008