Installation and Troubleshooting Guide

NOTE: This installation is to be completed by an Authorized Dealer or Professional Service Technicia. **Do not return to the Dealer or Distributor where the part was purchased. Contact CDI Electronics Directly for Return Materiel Authorization**.

CDI P/N: 194-9502

This unit will replace the 86255A 3, 77305A 2, 86255A2, 99502A 7, 99502A 8, 99502A 9, 99502A12 and 99502A12 series regulator/rectifiers

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 and Orange (Tape off or remove)

6. Reconnect the battery.

TROUBLESHOOTING

Recommended tools:
- CDI multimeter with DVA adapter (CDI 511-9773NL)
- Piercing probes (CDI 511-9770)
- Load bank

CHARGING VOLTAGE TOO LOW:

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.

CHARGING VOLTAGE TOO HIGH:

1. Compare the voltage on the battery's round posts to the voltage between the Purple (key on power) and engine ground. It should be less than 1 volt difference.
   A) Connect the meter's Black lead to the battery's round Negative (-) post.
   B) Connect the Red meter lead to the ground for the Regulator/Rectifier and start the engine. You should read less than 0.5V. If over the 0.5V, move the Red meter lead to the Negative battery cable on the engine. If the voltage drops back below the 0.5V, clean the ground connection between the mounting plate for the power pack and engine ground. Adding an additional ground wire from the mounting plate to the Negative battery cable on the engine is advised.
   C) If the Negative reading is OK, move the meter's Black lead to the battery's round Positive (+) post.
   D) Connect the Red meter lead to the Purple (Violet) for the Regulator/Rectifier and start the engine. You should read less than 1 V. If over the 1 V, move the Red meter lead to the Positive battery cable on the starter solenoid. If the voltage drops back below 0.5V, check the engine, boat side harnesses and keyswitch.
2. Try another battery, making sure it is a flooded ceil type.
3. Mve the Purple sense wire from the Choke lead to the Red wire on the starter solenoid. If the voltage stabilizes, check the engine harness, boat harness and keyswitch.
4. Check the stator's Yellow wires for a short to engine ground. If found, replace the stator.

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 and observe the amp meter.
5. If the amperage is low,
6. Check the purple wire for voltage while the engine is running. You should see the same voltage as the battery.
7. 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.
8. If the amperage is correct, but the battery voltage remains low, replace the battery.

BENCH TEST

Diode plate check:

1. 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. NOTE: Some meters will show a high reading instead of an open.
2. Check the resistance from each Yellow wire to engine or case ground, you should have a high reading, typically in the M range.
3. The Red wire should not read to ground or show a very high reading, 25 M ohms or more.