

NOTE: This installation is to be completed by an Authorized Dealer or Professional Service Technician. For questions regarding installation or warranty, call CDI Tech Support at 866-423-4832. **Do not return to the Dealer or Distributor where the part was purchased. Contact CDI Electronics Directly for Return Material Authorization.**

CDI P/N: 197-0001 Yamaha Voltage Regulator Replaces P/N: 6R3-81960-00-00 and 6R3-81960-10-00

WARNINGS:

- This product is designed for installation by a professional marine mechanic. CDI 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!!!**
- **NEVER DISCONNECT THE BATTERY WHILE THE ENGINE IS RUNNING AS THIS MAY BURN OUT THE REGULATOR/RECTIFIER. If the boat is equipped with a battery switch, make sure that it is a make before break type.**

INSTALLATION

1. Disconnect the negative battery cable.
2. Disconnect and remove the old regulator/rectifier.
3. Install the new regulator/rectifier, using the original mounting bolts.
4. Connect the Black wire to a clean engine ground.
5. Connect the stator's 3 wire connector to the new regulator/rectifier.
6. Connect the Red wire with the Round connector from the harness to the mating connector from the regulator/rectifier.
7. Connect the Red wire with the bullet connector to the mating connector going to the fuse if present. If there is no connection for this wire, use a cable tie to tie it out of the way so it does not short out.
8. Reconnect the negative battery cable.

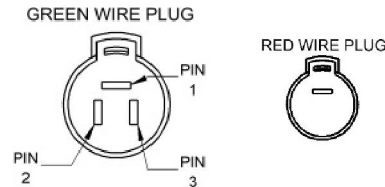
TROUBLESHOOTING

BATTERY IS NOT BEING CHARGED:

1. Clean all Battery cables, engine and battery connections, both on the engine and on the battery.
2. Install a clamp on ammeter capable of reading at least 30 amperes on the Red battery cable connected to the starter solenoid. Start the engine and see if the ammeter is showing a charge going into the battery. If so, swap out the battery for a known good one. If the engine now shows a charge going into the battery, the old battery is defective.

3. Check the resistance between the stator's Green wires as follows:

Read From	Read To	Disconnected
Green 1	Green 2	0.27 to 0.43 Ω
Green 1	Green 3	0.27 to 0.43 Ω
Green 2	Green 3	0.27 to 0.43 Ω



4. Disconnect all connections to the Regulator/Rectifier. Then, using a Multimeter set to diode scale, check the Diodes between the Regulator/Rectifier's Green wires and the Red Wire as follows:

Red Meter Lead Connection	Black Meter Lead Connection	Reading
Green 1	Red Lead from Regulator/Rectifier	0.4 to 0.6
Green 2	Red Lead from Regulator/Rectifier	0.4 to 0.6
Green 3	Red Lead from Regulator/Rectifier	0.4 to 0.6
Red Lead from Regulator/Rectifier	Green 1	Open or No Reading
Red Lead from Regulator/Rectifier	Green 2	Open or No Reading
Red Lead from Regulator/Rectifier	Green 3	Open or No Reading

5. Check the DVA voltage on stator's Green wires as follows:

Read From	Read To	Disconnected	Connected	At 1500 RPM	At 3500 RPM
Green 1	Green 2	7V (at cranking)	7V (at cranking)*	13 V*	11 V*
Green 1	Green 3	7V (at cranking)	7V (at cranking)*	13 V*	11 V*
Green 2	Green 3	7V (at cranking)	7V (at cranking)*	13 V*	11 V*

*Connected to the Regulator/Rectifier. If the voltage is too high, the Regulator/Rectifier may be defective. If the voltage is too low, the stator is likely defective.

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Maximum Output Test

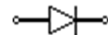
(Verify the maximum output of your engine using the factory Service Manual)

1. Install a clamp on ammeter capable of reading at least 30 amperes 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 Dynometer, start the engine and bring the RPM up to approximately 3500 in gear.
4. Turn on the load bank switches to increase the battery load to equal at least 20 Amps.
5. Check the ammeter, you should see approximately 16 Amps. If the amperage is too low, replace the battery and retest. If is still too low, check the stator resistance and DVA.
6. Increase RPM to 5500 RPM in gear.
7. Turn on the load bank switches to increase the battery load to equal at least 30 Amps.
8. Check the ammeter, you should see approximately 20 Amps. If the

Bench Test (Disconnected)

Rectifier/Regulator Diode plate check:

1. Test the forward diodes between the three Green wires and the red wire, with the meter set to Diode test.



Meter Lead	Read From	Meter Lead	Read To	Reading
Red	Green 1	Black	Red	about 0.5
Red	Green 2	Black	Red	about 0.5
Red	Green 3	Black	Red	about 0.5
Black	Green 1	Red	Red	Very high or open
Black	Green 2	Red	Red	Very high or open
Black	Green 3	Red	Red	Very high or open

2. Test for shorts to the Black ground wire, with the meter set to ohms test.

Meter Lead	Read From	Meter Lead	Read To	Reading
Red	Green 1	Black	Black	Open or Reading in the M (Million) range.
Red	Green 2	Black	Black	Open or Reading in the M (Million) range.
Red	Green 3	Black	Black	Open or Reading in the M (Million) range.
Black	Green 1	Red	Black	Open or Reading in the M (Million) range.
Black	Green 2	Red	Black	Open or Reading in the M (Million) range.
Black	Green 3	Red	Black	Open or Reading in the M (Million) range.
Red	Red	Black	Black	Open or Reading in the M (Million) range.
Black	Red	Red	Black	Open or Reading in the M (Million) range.