



Installation and Troubleshooting Guide



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 Materiel Authorization.**

CDI P/N: 174-9610A18 Stator Conversion Kit

This stator conversion kit replaces the following Regulator/Rectifiers and 40 Amp Stators: 18736A 3, 18736A 8, 18736A14, 18736A15, 18736A20, 18736A21, 398-9610A 3, A 5, A 6, A 9, A14, A17, A19, A22 and A24.

Warning! 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.

It is recommended that dielectric grease (i.e. CDI P/N: 991-9705) be used in the bullet nose connectors.

INSTALLATION

To Replace the 398-9610A3, A5, A6, A9 and A14 stators and 18736 Regulator/Rectifier:

1. Disconnect the battery cables.
2. Disconnect the stator wires from the switch box, engine ground and the rectifier/regulator.
3. Remove the flywheel.
4. Mark the position of the stator mounting screws in relation to where the stator wires come out of the old stator.
5. Disconnect the old regulator/rectifier.
6. Disconnect the green wires from the ignition coils and the high tension leads from the spark plugs.
7. Remove the coil plate covering the regulator/rectifier.
8. Disconnect the stator leads from the switch boxes.
9. Remove the old stator and regulator/rectifier.
10. Orient and install the new stator (using a good thread-locker applied to the bolts) in the same position as the old stator on the engine and install the flywheel, following the service manual instructions.
11. Clean the gasket area where the o-ring sealed the old regulator/rectifier.
12. Using the new spacers and bolts, mount the new regulator/rectifier plate assembly with the coil plate. (Wires up).
13. Reconnect the wires to the ignition coils.
14. Connect the new regulator/rectifiers to the stator, tachometer lead, and terminal strip. *The small red wire and the purple wire are not used in this application.* Match the short yellow stator wires to one regulator/rectifier and the long yellow stator wires to the other regulator/rectifier.
SERVICE NOTE: It is recommended that dielectric grease (i.e. CDI P/N 991-9705) be used in the bullet nose connectors to help prevent corrosion.
15. Install the flywheel on the engine, following the service manual instructions.
16. Connect the red leads from the rectifier/regulator to the positive battery terminal of the starter solenoid and the gray tachometer lead from the harness to one of the regulator/rectifiers. *INSTALLATION NOTE: These regulator/rectifiers will cause a small spark when you reconnect the battery and will draw a very small amount of current from the battery (Less than 0.001 amp).*
17. Connect the red, red/white, blue and blue/white wires to the switch boxes.
18. Connect the Black wire to engine ground.
19. Reconnect the battery cables.

STATOR TROUBLESHOOTING

NOT CHARGING THE BATTERY:

1. Check resistance between the yellow wires in each set, you should read approximately 0.3 ohms between the wires in each set.
2. Check the resistance from each yellow wire to engine ground, you should not read any resistance (NOTE: If your fingers are touching both test leads, you will show a high resistance – your body's resistance). Resistance to ground indicates a bad stator.

NO FIRE ON ANY CYLINDER:

1. Inspect the flywheel outer and trigger magnets to see if they are loose or broken.
2. Check stator resistance and DVA output

From	To	Ohms	DVA Connected	DVA Disconnected
Blue	Eng Ground	2100-2500	140 or more	140 or more
Blue/White	Eng Ground	2100-2500	140 or more	140 or more
Red	Eng Ground	28-32	20 or more	20 or more
Red/White	Eng Ground	28-32	20 or more	20 or more

3. Disconnect the rectifier/regulator and retest. If the fire returns, replace the rectifier/regulator.
4. Disconnect red and red/white wires and retest. If DVA test above was OK, the switch box is usually bad.

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NO SPARK ON ONE BANK (ODD OR EVEN CYLINDERS ON INLINE 6 CYLINDER):

1. Check the resistance and DVA voltage of the stator as follows:

From	To	Ohms	DVA Connected	DVA Disconnected
Blue	Eng Ground	2100-2500*	140 or more	140 or more
Blue/White	Eng Ground	2100-2500*	140 or more	140 or more
Red	Eng Ground	28-32*	20 or more	20 or more
Red/White	Eng Ground	28-32*	20 or more	20 or more

* Verify the resistance readings are in the same ballpark. i.e, If one coil reads 30 ohms and the other reads 50, the stator is likely defective.

2. Swap both sets of the stator wires between the packs. If the problem moves, replace the stator.
3. If the problem stays on the same bank, swap physical location and all connections of the two packs. If the problem stays with one pack, replace the pack. NOTE: If the pack is bad, it is recommended that BOTH packs be replaced AS A SET.

INTERMITTANT SPARK ON ONE OR MORE CYLINDERS:

1. Disconnect the white/black wire between the packs on a 6 cylinder and retest. If all cylinders now fire, replace both packs as there is a problem in the bias circuitry.
2. On all others, check for low voltage from the stator and trigger. Disconnect the rectifier and retest. If the problem disappears, replace the rectifier.
3. Check the trigger as follows:

BLACK SLEEVE TO	YELLOW SLEEVE TO	Resistance	DVA Reading
Brown wire	White wire	800-1400	4V or more Connected
White wire	Purple wire	800-1400	4V or more Connected
Purple wire	Brown wire	800-1400	4V or more Connected
Brown wire	- Engine Ground	Open	1 V or more Connected
White wire	- Engine Ground	Open	1 V or more Connected
Purple wire	- Engine Ground	Open	1 V or more Connected
-	Brown wire	Engine Ground	Open
-	White wire	Engine Ground	Open
-	Purple wire	Engine Ground	Open

ENGINE WILL NOT STOP RUNNING:

Connect a jumper wire to the Black/Yellow terminal or wire coming out of the switchbox and short it to ground. If this kills the engine, the kill circuit in the harness or on the boat is bad, possibly the ignition switch.

HIGH SPEED MISS OR WEAK HOLE SHOT:

1. Disconnect the rectifier and retest. If miss is gone, the rectifier is usually at fault. Remember a problem rectifier can damage a stator.
2. DVA check the Blue and Blue/White wires to engine ground and do a running test. The voltage should show a smooth climb and stabilize, gradually falling off at higher RPM's (above 3000). If you see a sudden drop in voltage right before the miss becomes apparent, the stator is likely at fault.
3. Check DVA voltage on the Red wires reference to engine ground of the stator at high speed. **NOTICE:** Use caution when doing this and do not exceed the rated voltage range of your meter. The readings should show a smooth climb in voltage. If there is a sudden or fast drop in voltage right before the miss becomes apparent, the stator is usually at fault. If there is no indication of the problem, it could be mechanical problem.
4. Rotate the stator one bolt hole in either direction and re-test. If the miss is gone, leave the stator as is. If the miss is worse, rotate the stator back where it was.
5. Using extreme caution, on the water or connected to a dyno, take the engine to the RPM where the problem is occurring and hold it for a few seconds, then perform a high speed shutdown at that RPM. Check the sparkplugs for differences in color or the presence of water droplets on the sparkplug (an indicator of a possible crack in the engine block).

NO SPARK WITH THE SPARKPLUGS INSTALLED:

1. Check for dragging starter or low battery causing slow cranking speed. DVA test stator and trigger.
2. Disconnect rectifier, regulator and retest. If the problem goes away, replace the rectifier and/or regulator.

SPARK ON ALL CYLINDERS BUT ENGINE WILL NOT RUN:

Disconnect the White/Black wire and check the bias circuit (White/Black terminals) resistance to engine ground. Readings should be approximately 15,000Ω for standard packs. If the readings are correct on the packs, index the flywheel and check timing on all individual cylinders. If the timing varies, replace BOTH packs.

DESTROYED ONE OR TWO CYLINDERS/PISTONS:

1. Check Bias resistance, from the White/Black stud to engine ground, you should read 13,000-15,000 ohms. Readings above 15,000 ohms or less than 13,000 ohms indicate a defective switchbox. REPLACE BOTH SWITCHBOXES AS A SET!!!!

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2. Use an ANALOG DC Voltmeter to check the voltage on the White/Black (Bias) terminal. With everything connected, run the engine at various Rpm's and watch the voltage reading. It should remain steady for a set RPM. Fluctuation in voltage indicates a problem in the bias circuit. If there is a problem, disconnect everything on the White/Black terminal except the jumper from the inside switchbox to the outside switchbox. Retest, if the problem persists, replace BOTH switch boxes. If the problem went away, reconnect the items taken off of the White/Black terminal one at a time, retest after every reconnection until you locate the source of the problem.

OVER-CHARGING THE BATTERY:

1. Verify the cranking battery is not an AGM, Maintenance free or Gel Cell battery. It needs to be a traditional flooded cell battery.
2. Disconnect one of the regulators at a time and see if one or both are causing the problem. Replace as needed.
3. Swap the battery with a known good one. If no change, check the resistance of the Yellow wires to engine ground. It should read open. A short on one wire can cause over-charging.

REGULATOR/RECTIFIER TROUBLESHOOTING

NO TACHOMETER

1. At 800-1000 RPM, check output on the gray wire, reading should be at least 8 volts with a DVA meter. A low reading usually indicates a bad regulator if the system is charging the battery.
2. Check the resistance between the gray wire and engine ground. You should read above 100K (100,000) ohms. Gray to red, and gray to the yellow wires should be a high reading, usually in the M range.

OUTPUT TEST

1. Install an ammeter capable of reading at least 40 amps in-line on the red wires 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 4500 in gear.
4. Turn on the load bank switches to increase the battery load to equal 40 Amps.
5. Check the ammeter.
6. If the amperage is low,
 - A) Check the load bank for battery draw.
 - B) Reconnect the ammeter between the red wires from one of the regulator/rectifiers and the terminal strip. Retest. You should show about 20 Amps from each regulator/rectifier.
 - C) If the output is still low, check and clean all connections between the battery and the regulator/rectifier plate.
7. If the amperage is correct, but the battery voltage remains low, replace the battery.

BENCH TEST

Diode plate check:

Test the forward diodes between the two yellow wires and the red wire. You should get a reading of about 45K (45,000) on one and a high reading on the other. Check the resistance from each of the yellow wires to case ground, you should get a reading of about 56K (56,000) on one and a high reading on the other. The red wire should read about 14K (14,000) ohms to ground.

Tachometer Circuit:

Check the resistance between the gray wire and engine ground. You should read above 100K (100,000) ohms. Gray to red, and gray to the yellow wires should be a high reading, usually in the M range.