Installation and Troubleshooting Guide

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: 114-7452K 1

This unit replaces 18-5777, 18-5778, 339-7452A1, A7, A8, A9, A10, A11, A13, A14, A15, A18, A19, and A21.

Warning! This product is designed for installation 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.

How to test the Engine Stop Circuit (Kill) for DC Voltage:

1. DC voltage present on the kill circuit of the Switchbox due to a faulty key switch, boat harness, or engine harness will severely damage the Switchbox's internal kill circuit**.** Connect a Digital Multi Meter to the Ignition Stop wire(s) AT THE SWITCHBOX(S) while disconnected from the Switchbox in reference to a known good engine ground. Turn the Ignition switch on and off several times. If, at any time, you see over 2 VDC on the kill wire(s), there is a problem with one or both harnesses and/or the Ignition switch. The Ignition Stop wire should not be connected back to the new Switchbox at any point until the problem is corrected **OR DAMAGE TO THE SWITCHBOX WILL OCCUR**!

INSTALLATION

1. Disconnect the negative battery cable.
2. Disconnect all wires connected to the Switchbox and remove the Green Primary wires from the Ignition coils. Pay attention to which Primary wire goes to which Ignition coil.
3. Unbolt and remove the old Switchbox.
4. Bolt the new Switchbox on, using the new bolts supplied.
5. It is recommended that dielectric grease be used in the bullet nose connectors to help prevent corrosion.
6. Reconnect the negative battery cable.

TROUBLESHOOTING

NO SPARK ON EITHER CYLINDER:

1. Disconnect the Black/Yellow stop wire AT THE SWITCHBOX and retest. If the engine now has spark, the stop circuit has a fault. Check the key switch and harness.

   Note: Do not confuse the Black/Yellow Low speed Stator wire for the Stop wire. When in doubt, trace the wire to the wiring harness to confirm that you are unplugging the correct wire going the stop wire and not the Stator wire.

2. Verify the Flywheel only has 2 outer magnets not 4 magnets. The newer ignition system has a 4 magnet Flywheel and uses a 114-5713 Switchbox and Stator with the White/Green & Green/White wires.
3. Inspect and clean all engine and ignition ground connections. Make sure the Switchbox and Ignition coils are grounded.
4. Disconnect the Yellow wires from the Stator to the Rectifier and retest (If present). If the engine has spark, replace the Rectifier.
5. Check the Stator and Trigger DVA and resistance:

Read from	Read to	OEM Ohms	CDI OHMS	DVA (Connected)	DVA (Disconnected)
Black/Yellow (Low Speed Coil)	Engine Gnd	3.25-3.8K Ω	2.2-2.75 Ω	180 V Minimum	180 V Minimum
Black/White (High Speed Coil)	Engine Gnd	150-250 Ω	200-250 Ω	25 V Minimum	25 V Minimum
Brown/Yellow (#1 Trigger)	Brown/White (#2 Trigger)	650-850 Ω	650-850 Ω	4 V Minimum	4 V Minimum
Brown/Yellow (#1 Trigger)	Engine Gnd	Open	Open	4 V Minimum	-
Brown/White (#2 Tigger)	Engine Gnd	Open	Open	4 V Minimum	-

6. Check the DVA on the Black/Yellow kill wire coming out of the Switchbox. You should have a reading of at least 150 DVA or more. The Stator and Trigger should be connected to the Switchbox for this test. If you do not, check the DVA on the Stator and the Trigger. If the DVA on the Stator and Trigger but the DVA on the Black/Yellow Kill wire coming out of the Switchbox is low, the Switchbox is likely faulty.
7. Check the cranking RPM. A cranking speed of less than 250 RPM may not allow the system to spark properly. This can be caused by a weak battery, dragging starter, bad battery cables, or a mechanical problem inside the engine.
8. Check the flywheel magnets for cracked, broken, or loose magnets.
9. Check the DVA on the Green wires from the Switchbox while connected to the Ignition coils. Check the reading on the Switchbox terminal AND on the Ignition coil terminal. You should have a reading of at least 150 DVA minimum at both terminals. If the reading is low on one cylinder, disconnect the Green wire from the Ignition coil for that cylinder and reconnect it to a Pack Load Resistor. Retest. If the reading is now good, the Ignition coil is likely bad. A continued low reading symptom indicates a bad Switchbox.

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NO SPARK OR INTERMITTENT SPARK ON ONE CYLINDER:

1. Disconnect the Black/Yellow kill wire FROM THE SWITCHBOX (remember to leave the Black/Yellow from the Stator connected to the Switchbox).
2. Check for broken or bare wires on the Switchbox, Stator, and Trigger.
3. Check the outer flywheel magnets for cracked, broken, or loose magnets.
4. Check the Stator and Trigger resistance and DVA:

Read from	Read to	OEM Ohms	CDI OHMS	DVA (Connected)	DVA (Disconnected)
Black/Yellow (Low Speed Coil)	Engine Gnd	3.25-3.8K Ω	2.2-2.75 Ω	180 V Minimum	180 V Minimum
Black/White (High Speed Coil)	Engine Gnd	150-250 Ω	200-250 Ω	25 V Minimum	20 V Minimum
Brown/Yellow (#1 Trigger)	Brown/White (#2 Trigger)	650-850 Ω	650-850 Ω	4 V Minimum	4 V Minimum
Brown/Yellow (#1 Trigger)	Engine Gnd	Open	Open	4 V Minimum	-
Brown/White (#2 Tigger)	Engine Gnd	Open	Open	4 V Minimum	-

5. Check the DVA on the Green Primary wires from the Switchbox while connected to the Ignition coils. Check the reading on the Switchbox terminal AND on the Ignition coil terminal. You should have a reading of at least 150 V minimum at both places. If the reading is low on one cylinder, disconnect the Green Primary wire from the Ignition coil for that cylinder and connect it to a Pack Load resistor. Retest. If the reading is now good, the Ignition coil is likely bad. A continued low reading indicates a bad Switchbox.
6. Check the Ignition coil's primary resistance from the positive (+) terminal to the negative (-) terminal. You should read 0.02-0.04 Ω.
7. Check the Ignition coil's secondary resistance from the sparkplug wire to engine ground. You should read 0.8-1.1K Ω. If out of this range, replace the Ignition coil.
8. Connect an inductive tachometer to each cylinder and compare the RPM readings at the RPM where the problem is occurring. If only one cylinder is dropping out, swap the Ignition coil locations and retest. If the problem follows a coil, replace the coil. If it stays on the same spark plug, replace the Switchbox.

ENGINE WILL NOT STOP (KILL):

1. Check the kill circuit in the Switchbox by using a jumper wire connected to the Black/Yellow wire (remember to leave the Black/Yellow from the Stator connected to the Switchbox) coming out of the Switchbox and shorting it to ground. If this kills the engine, the kill circuit in the harness or on the boat is bad, possibly the ignition switch. If this does not stop the Switchbox from sparking, replace the Switchbox.

HIGH SPEED MISS:

1. Check the DVA of the Stator while running the engine. It should show a smooth climb on the Black/White wire. 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.
2. Perform a high-speed shutdown and read the spark plugs. Check for water. A crack in the block can cause a miss at high speed when the water pressure gets high, but a normal shutdown will mask the problem because the water will evaporate off the spark plug before you can identify it.

BOTH CYLINDERS HAVE SPARK BUT THE ENGINE WILL NOT RUN:

1. Check the flywheel shear key.
2. Index the flywheel and check timing on both cylinders. If the timing is off, check the Trigger and flywheel center hub Trigger magnet. If no other fault is found, replace the Switchbox.

WILL NOT ACCELERATE BEYOND 3000-4000 RPM:

1. Connect a DVA meter between the Stator's Black/Yellow wire and engine ground. Run the engine up to the RPM where the problem is occurring. DVA should increase with RPM. A sharp drop in DVA right before the problem occurs usually indicates a bad Stator.
2. Connect a DVA meter between the Stator's Black/White wire and engine ground. The DVA should show a smooth climb in voltage and remain high through the RPM range. A reading lower than on the Black/Yellow wire/terminal reading indicates a bad Stator.
3. Connect an inductive tachometer to each cylinder in turn and try to isolate the problem. A single cylinder dropping spark will likely be a bad Switchbox or Ignition coil. All cylinders not sparking properly usually indicates a bad Stator.
4. Check the flywheel magnets for cracked, broken, or loose magnets.

MISS AT ANY RPM:

1. Disconnect the Yellow wires from the Stator to the Rectifier and retest. If the miss clears, replace the Rectifier.
2. In the water or on a Dynamometer, check the DVA on the Green Primary wires from the Switchbox while connected to the Ignition coils. You should have a reading of at least 150 DVA or more, increasing with engine RPM until it reaches 300-400 DVA maximum. A sharp drop in DVA right before the miss becomes apparent on all cylinders will normally be caused by a bad Stator. A sharp drop in DVA on less than all cylinders will normally be the Switchbox or Trigger.
3. Connect an inductive tachometer to each cylinder in turn and try to isolate the problem. A high variance in RPM on one cylinder usually indicates a problem in the Switchbox or Ignition coil. Occasionally a Trigger will cause this same problem. Check the Trigger DVA (see **NO SPARK OR INTERMITTENT SPARK ON ONE CYLINDER**).
4. Check the flywheel magnets for cracked, broken, or loose magnets.

SWITCHBOX REPEATEDLY BLOWS ON SAME CYLINDER:

1. Check the Trigger wires for shorts to engine ground as a shorted Trigger wire can destroy a SCR inside the Switchbox.
2. Replace the Ignition coil on the cylinder dropping spark.