



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: 174-6617K 1

This unit replaces the following P/N's: 86617,A 2, A 3, A 5, A 9, A11, A13, A19, and A20.

Warning! 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.

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 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

To replace the 86617A11:

1. Disconnect the Negative battery cable.
2. Disconnect the old Stator from the Switchbox.
3. Remove the flywheel and old Stator according to the service manual for your engine.
4. Using the original bolts, install the new Stator per OEM specifications with a thread locker applied.
5. Connect the Black wire to a clean engine ground.
6. Cut the bullet connectors off from the Black/Yellow and Black/White wires. Slide the supplied heat shrink over the wires, then crimp and solder the supplied ring terminals to the wires. Heat the heat shrink over the crimp of the ring terminals.
7. Connect the Black/White and Black/Yellow wires to the Switchbox using the original nuts.
8. Reinstall flywheel according to the service manual for your engine.
9. Reconnect the Negative battery cable.

To replace the 86617A 2, A 3, A 5, A 9, A13, A19, and A20:

1. Disconnect the Negative battery cable.
2. Disconnect the old Stator from the Switchbox.
3. Remove the flywheel and old Stator according to the service manual for your engine.
4. Using the original bolts with a thread locker applied, install the new Stator according to service manual specifications.
5. Connect the Black wire to a clean engine ground.
6. Connect the Black/White and Black/Yellow wires to the Switchbox using the installed bullet connectors.
7. Install the flywheel according to the service manual for your engine.
8. Reconnect the Negative battery cable.

TROUBLESHOOTING

NO SPARK ON ANY CYLINDER:

1. Disconnect the Black/Yellow stop wire AT THE SWITCHBOX and retest. If the engine's Ignition now has spark, the stop circuit has a fault. Check the key switch, harness, and shift switch (if present).
2. Check the cranking RPM. A low cranking speed 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.
3. Inspect and clean all engine and Ignition ground connections.
4. Check the Stator and Trigger as follows:

Read from	Read to	OEM Ohms	CDI Ohms	DVA (Connected)	DVA (Disconnected)
Black/Yellow (Low speed coil)	Black (Stator ground)	3.25-3.8K Ω	2.2-2.75K Ω	180 V Minimum	180 V Minimum
Black/White (High speed coil)	Black (Stator ground)	150-250 Ω	220-265 Ω	25 V Minimum	25 V Minimum
Brown/Yellow (#1 Trigger)	Brown/White (#2 Trigger)	650-850 Ω	700-800 Ω	4 V Minimum	4 V Minimum
Brown/Yellow (#1 Trigger)	Engine Gnd	Open	Open	1 V Minimum	-
Brown/White (#2 Trigger)	Engine Gnd	Open	Open	1 V Minimum	-

CDI Electronics, LLC • 353 James Record Road SW • Huntsville, AL 35824 USA

Web Support: www.cdielectronics.com • Tech Support: 1-866-423-4832 • Order Parts: 1-800-467-3371

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NO SPARK OR INTERMITTENT SPARK ON ONE CYLINDER:

1. Check the flywheel magnets for cracked, broken, or loose magnets.
2. Check the Trigger resistance and DVA:

Read from	Read to	OEM Ohms	CDI Ohms	DVA (Connected)	DVA (Disconnected)
Brown/Yellow (#1 Trigger)	Brown/White (#2 Trigger)	650-850 Ω	700–800 Ω	4 V Minimum	4V Minimum
Brown/Yellow (#1 Trigger)	Engine Gnd	Open	Open	1 V Minimum	-
Brown/White (#2 Trigger)	Engine Gnd	Open	Open	1 V Minimum	-

3. 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 V or more at both places.

NOTE: 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 (CDI P/N 511-9775). Retest. If the Reading is now good, the Ignition coil is likely bad. A continued low Reading indicates a bad Switchbox or Trigger.

4. Swap the Triggers wires from the Trigger to the Switchbox. Due to the connectors being different on the Brown/White and the Brown/Yellow wires, a small jumper wire will be needed. If the no spark issue stays on the same cylinder as before, this means that the Switchbox or the Ignition coil are likely defective. If the no spark issue moves to the opposite cylinder, the Trigger is likely defective.
5. Check the Ignition coil's primary resistance from the Positive (+) Terminal to the Negative (-) Terminal. You should read 0.02-0.04 Ω on the OEM Ignition coil and 0.04-0.08 Ω on CDI Ignition coil.
6. Check the Ignition coil's secondary resistance from the sparkplug wire to engine ground. You should read 0.8-1.1K Ω on the OEM Ignition coil and 1.31-1.45K Ω on CDI Ignition coil. If out of this range, replace the Ignition coil.
7. 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 Ignition coil. If it stays on the same spark plug, replace the Switchbox.

WILL NOT STOP (KILL):

1. Disconnect the Black/Yellow stop wire at the Switchbox. Connect a jumper wire to the Black/Yellow stop terminal (or wire) from the Switchbox and short it to engine ground. If this stops the Switchbox from sparking, the stop circuit has a fault. Check the key switch and harness. If this does not stop the Switchbox from sparking, replace the Switchbox.

HIGH SPEED MISS:

1. Check the DVA of the Stator from the Black/Yellow Stator wire to the Black wire while running the engine. It should show a smooth climb on the voltage. If there is a sudden or fast drop in voltage right before the miss becomes apparent, the Stator is usually at fault.

Use caution when doing this and do not exceed the rated voltage range of your meter.

2. Verify the correct spark plugs are installed. OEM calls for an NGK BP8H-N-10 or NGK BPZ8H-N-10. If the NGK BP8H-N-10 spark plugs are installed, try the BPZ8H-N-10 spark plugs.
3. Test for water leaks into either one or both cylinders.

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. If no other fault is found, replace the Switchbox.



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MISS AT ANY RPM:

1. In the water or on a Dynamometer, check the DVA on the Green 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.
2. Connect a DVA meter between the Stator's Black/Yellow wire/terminal 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.
3. Connect a DVA meter between the Stator's Black/White wire/terminal 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.
4. 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**).
5. 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.
6. Check the flywheel magnets for cracked, broken, or loose magnets.