



# 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: 113-4808

This unit replaces the following P/N's: 18-5774, 18-5780, 584808, 585145, 585189, 5004532, and 5004533.

**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.**

**Please use the Factory recommended spark plug (currently Champion QL77JC4 or QL78YC) gapped at 0.030".**

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

1. DC voltage present on the kill circuit of the Power Pack due to a faulty key switch, boat harness, or engine harness will severely damage the Power Pack's internal kill circuit. Connect a Digital Multi Meter to the Ignition Stop wire AT THE POWER PACK while disconnected from the Power Pack 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, 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 Power Pack at any point until the problem is corrected **OR DAMAGE TO THE POWER PACK WILL OCCUR!**

## INSTALLATION

1. Disconnect the negative battery cable.
2. Disconnect all of the wires going to the old Power Pack.
3. Remove the Power Pack mounting bolts.
4. Clean ALL engine grounds, especially where the Power Pack is grounded.
5. Connect the wires from the new Power Pack to the Stator, Timer Base, and Ignition coils. Connect the Orange/Blue coil lead to the top Ignition coil, the Orange/Purple coil lead to the middle Ignition coil, and the Orange/Green lead to the bottom Ignition coil.
6. Some engines do not need the pigtail three wire adapter. If not, simply remove the pigtail.
7. Use a small amount of dielectric silicone grease in the bullet connectors (if used).
8. Position the Stator wire connector in the slot provided in the metal bracket.
9. Position the Timer Base wire connector in the slot provided in the bracket.
10. Mount the new Power Pack using the original bolts.
11. Reconnect the negative battery cable.

## TROUBLESHOOTING

### NO SPARK ON ANY CYLINDER:

1. Disconnect the Black/Yellow stop wire from the Power Pack 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. Disconnect the Yellow wires from the Stator to the Regulator/Rectifier and retest. If the engine fires, replace the Regulator/Rectifier.
3. 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.
4. Check the Stator and Timer Base resistance and DVA as given below:

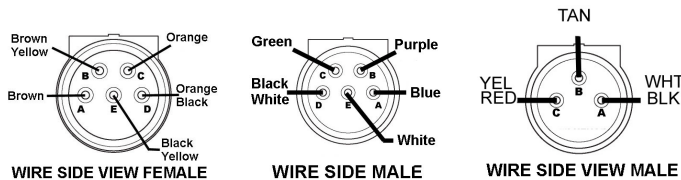
Read from	Read to	OEM Ohms	CDI Ohms	DVA (Connected)	DVA (Disconnected)
Brown (Stator)	Brown/Yellow (Stator)	750-950 Ω	650-850 Ω	150-400 V	150-400 V
Orange (Power Coil)	Orange/Black (Power Coil)	360-440 Ω	45-55 Ω	11-22 V	45-120 V
White (Common)	Blue (#1 Timer Base)	1-5M Ω	1-5M Ω	100-400 V	0.6 V Minimum
White (Common)	Purple (#2 Timer Base)	1-5M Ω	1-5M Ω	100-400 V	0.6 V Minimum
White (Common)	Green (#3 Timer Base)	1-5M Ω	1-5M Ω	100-400 V	0.6 V Minimum
White (Common)	Black/White (Quick Start Timer Base)	400-500 Ω	400-500 Ω	6-10 V (a)	6-12 V

**(a) DVA will drop below 1 V when the engine drops out of Quick-Start (engine is over 104° F or 1200 RPM).**

5. Check the DVA on the Black/Yellow kill wire coming out of the Power Pack. You should have a reading of at least 150 DVA or more. The Stator and Timer Base should be connected to the Power Pack for this test. If you do not, check the DVA on the Stator and Timer Base. If the DVA on the Stator and Timer Base is good but the DVA on the Black/Yellow Kill wire coming out of the Power Pack is low, the Power Pack is likely faulty.

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- Verify the wiring in the connectors as follows:



- Check the Trigger and Charge coil flywheel magnets for cracked, broken, or loose magnets.
- Index the flywheel and check the Ignition timing on all cylinders. The timing should be close to the same offset as #1 cylinder.

## NO SPARK OR INTERMITTENT SPARK ON ONE OR MORE CYLINDERS:

- Check the Stator and Timer Base resistance and DVA ( see **NO SPARK ON ANY CYLINDER**).
- Check the DVA on the Orange wires from the Power Pack while connected to the Ignition coils. You should have a reading of 150 V minimum.
- Visually inspect the Ignition coils for burned, discolored areas, or cracks in the casing (indicating arcing inside the coil itself).
- Swap the Ignition coil with one that is sparking correctly.
- Rare causes include a weak Trigger magnet in the flywheel. If possible, try another flywheel.
- Check the Power Pack resistance as given below:

Read from	Read to	Ohms
Orange/Blue (#1 Primary Wire)	Blue (#1 Timer Base Input)	110 Ω (a)
Orange/Purple (#2 Primary Wire)	Purple (#2 Timer Base Input)	110 Ω (a)
Orange/Green (#3 Primary Wire)	Green (#3 Timer Base Input)	110 Ω (a)
White (Common)	Black (Engine Gnd)	Shorted
Brown (Stator Input)	Black (Engine Gnd)	Open or M range
Brown/Yellow (Stator Input)	Black (Engine Gnd)	Open or M range

**(a) Use a comparison reading as different brands of meters will give different readings. The typical range is 90-150 Ω for the Orange wires. You should have approximately the same ohm reading on all three tests with the Orange wires. If one of the SCR's inside the Power Pack is shorted or open, the readings will be quite a bit different.**

**NOTE: If the Orange Primary DVA reading is low on one cylinder, disconnect the 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 within specification, the Ignition coil is likely defective. If it still measures low, this indicates a defective Power Pack If the Timer Base tests within specification.**

## MISS AT ANY RPM:

- Disconnect the Yellow wires from the Stator to the Regulator/Rectifier and retest. If the miss clears, replace the Regulator/Rectifier.
- In the water or on a Dynamometer, check the DVA on the Orange wires from the Power Pack 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 Power Pack or Timer Base.
- 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 Power Pack or Ignition coil. Occasionally a Timer Base will cause this same problem. Check the Timer Base DVA (see **NO SPARK ON ANY CYLINDER**).
- 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.
- Check the Trigger and Charge coil flywheel magnets for cracked, broken, or loose magnets.

## ENGINE WILL NOT STOP (KILL):

- Disconnect the Black/Yellow wire at the Power Pack. Connect a jumper wire to the stop wire from the Power Pack and short it to engine ground. If this stops the Power Pack from sparking, the stop circuit has a fault. Check the key switch, harness, and shift switch (if present).

## ENGINE WILL NOT ACCELERATE BEYOND 2500 RPM (Runs smooth below that RPM):

- Use a temperature probe and verify that the engine is not overheating.
- Disconnect the Tan temperature wire from the Power Pack and retest. Make sure to cut the key switch off killing the engine, and then crank the engine back again. This resets the circuit board inside the Power Pack. If the engine now performs properly, check the temperature switch, harness, and System Check Gauge.



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3. Make sure the Tan temperature switch wire is not located next to a spark plug wire (RF interference can activate the S.L.O.W function without sounding the warning horn).
4. If the engine will not rev above 2500 RPM and the Tan wire is disconnected from the Power Pack (and not near a spark plug wire), the Power Pack is likely defective. Make sure to cut the key switch off killing the engine, and then crank the engine back again. This resets the circuit board inside the Power Pack.

## ENGINE DIES WHEN QUICKSTART DROPS OUT:

1. Check Ignition timing at idle with the White/Black temperature wire disconnected. Remember to allow for the 12-15 ° drop in ignition timing when Quick Start disengages. Verify Ignition timing after the engine has warmed up.

## ENGINE STAYS IN QUICKSTART:

1. With the engine idling, check the Yellow/Red wire for DC voltage. If there is DC voltage over 2 V on this wire while the engine is running, the Quick Start will not disengage. A voltage of 5-7 V will not engage the starter solenoid yet will engage Quick Start.
2. Short the White/Black Temperature Switch wire FROM the Power Pack to engine ground. Start the engine, if the Quick Start drops out after approximately 5 seconds, replace the White/Black Temperature Switch.
3. Disconnect the Black/White wire from the Power Pack. If the Quick Start feature is not now working, replace the Power Pack.

## ENGINE WILL NOT ENGAGE QUICKSTART:

1. Disconnect the White/Black wire from the temperature sensor.
2. With the engine idling, check the Black/White Timer Base wire for DVA. There should be about 6-10 V on this wire while the engine is running for the Quick Start to engage. If the voltage is not present, verify the Power coil DVA on the Stator is between 10-22 DVA from the Orange to Orange/Black Connected. If the DVA is correct on the Orange to Orange/Black wires but the DVA on the Black/White is not correct, replace the Power Pack. If the Black/White wire has the correct DVA but Quick Start does not work, replace the Timer Base.

## POWER PACK OR TIMER BASE REPEATEDLY BLOWS ON SAME CYLINDER:

1. Check the Timer Base wires for shorts to engine ground as a shorted Timer Base wire can destroy a SCR inside the Power Pack.
2. In contrast, a shorted SCR inside the Power Pack can destroy a Timer Base coil. Check the Timer Base resistance and DVA (see **NO SPARK ON ANY CYLINDER**).
3. Replace the Ignition coil on the cylinder dropping spark.