



# 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 Material Authorization.**

## CDI P/N: 113-4642 Power Pack 8 Cylinder

This unit replaces the following P/N: 584642.

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.

### INSTALLATION

1. Disconnect the battery cables.
2. Remove the power pack mounting bolts and disconnect all of the wires going to the old power pack.
3. Connect the wires to the new power pack. Use a small amount of dielectric silicone grease in the bullet connectors.
4. Position the stator wire connectors in the lower slot provided in the electrical bracket.
5. Position the timer base wire connectors in the slot above the stator wire connectors in the electrical bracket.
6. Mount the new power pack using the original bolts (take special care not to pinch any wires).
7. Connect the Orange wires to the ignition coils per the service manual.
8. Reconnect the battery cables.

### TROUBLESHOOTING

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

Note: These engines usually have a 35 Amp battery charging capacity. Due to the size and weight of the flywheel magnets, it is highly recommended that you check to make sure both the triggering and charge magnets are still secure in the flywheel before you service the engine. A loose or broken magnet can be deadly. It is recommended you index the flywheel and check the timing on all cylinders when servicing these engines. Also check for static firing and intermittent spark.

#### NO SPARK ON ANY CYLINDER:

1. Disconnect the two Black/Yellow engine stop wires AT THE PACK and retest. If the engine's ignition now has spark, the stop circuit has a fault-possibly the key switch, harness or shift switch.
2. Disconnect the Yellow wires from the stator to the rectifier and retest. If the engine now has spark, replace the rectifier.
3. Check the resistance (Ohms) and DVA of the stator and trigger.

Read From	Read To	Ohms	DVA (connected)	DVA (disconnected)
Brown	Brown/Yellow	900-1100	150V or more	180V or more
Brown/White	Brown/Black	900-1100	150V or more	180V or more
Orange	Orange/Black	95-105	10-22V*	50 V or more
White (trigger)	Black/White (trigger)	150-170	6-10V**	NA

\*NOTE: Over 24 volts while connected indicates a broken wire in the connector or a defective power pack.

\*\*This is the QuickStart voltage going to the Timer Base to turn on the QuickStart circuit inside the Timer Base.

4. Check the timer base's resistance from the white wire in the 1st connector to the Blue, Green, Purple and Pink wires in both connectors. Reading should be approximately the same on all. If you have no readings, reverse the meter leads and retest to see if you now have a reading.
5. Check the DVA output from the timer base. A reading of at least 0.5V or more from the Blue, Green, Purple and Pink wires (while connected to the pack) is needed to fire the pack. Read from the white wire to both sides of the timer base's Blue, Green, Purple and Pink wires. A reading of 0.6V -4.0V indicates there is enough voltage going to the power pack to fire the SCR inside the pack. A reading over 90 volts indicates the SCR inside the power pack is firing, check the coil wire and coil.
6. Check the cranking RPM. A cranking speed of less than 250 RPM will not allow the system to fire the spark plugs properly.

#### NO SPARK OR INTERMITTANT SPARK ON ONE CYLINDER:

1. Check the timer base's resistance from the white wire to the Blue, Green, Purple and Pink wires in **both** connectors. Readings should be approximately the same on all. If the readings are off, reverse the meter leads and retest to see if the readings are corrected.
2. Check the DVA output from the timer base. A reading of at least 0.5V or more from the White wire to the Blue, Green, Purple and Pink wires. (while connected to the pack) is needed to fire the pack. Read from the White wire to both sides of the timer base's Blue, Green, Purple and Pink wires.
3. Check the DVA output on the Orange wires from the power pack while connected to the ignition coils. You should have a reading of at least 150V or more. If the reading is low on one cylinder, disconnect the orange 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 usually indicates a bad power pack.
4. Check the cranking RPM. A cranking speed of less than 250 RPM will not allow the system to fire the spark plugs properly.

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## NO SPARK OR INTERMITTANT SPARK ON ONE BANK:

1. Disconnect the Black/Yellow engine stop wires AT THE PACK and retest. If the engine's ignition now has spark, the stop circuit has a fault-possibly the key switch, harness or shift switch.
2. Disconnect the shift interrupter and retest. If all cylinders now have spark, replace the shift interrupter.
3. Check for cut, shorted or broken wires and terminals inside the connectors.
4. Check the resistance (Ohms) and DVA of the stator.

Read From	Read To	Ohms	DVA (connected)	DVA (disconnected)
Brown	Brown/Yellow	900-1100	150V or more	180V or more
Brown/White	Brown/Black	900-1100	150V or more	180V or more

5. Swap the stator charge coil leads going into the power pack. If the problem moves to the other bank, replace the stator.
6. Check the DVA output on the Orange wires from the power pack while connected to the ignition coils. You should have a reading of at least 150V or more. If the reading is low on one bank, disconnect the Orange wires from the ignition coil for that bank and reconnect them to a load resistor. Retest. If the reading is now good, one or both of the ignition coils are likely bad. A continued low reading indicates a bad power pack.
7. Check the cranking RPM. A cranking speed of less than 250 RPM will not allow the system to fire the spark plugs properly.

## ENGINE WILL NOT GO OVER 2600 RPM:

1. Use a temperature probe and verify that the engine is not overheating.
2. Disconnect the Tan warning system wire from the pack and retest. If the engine now performs properly, check both temperature sensors, VRO Sensor, Harness and System Check Gauge. If there is no change, replace the power pack.
3. Make sure the tan temperature switch wire is not located next to a spark plug wire.

## HIGH SPEED MISS:

1. Using the Piercing Probes and DVA adapter, check the DVA voltage at the RPM where the problem is occurring while connected as follows:

Red Lead	Black Lead	DVA
Brown	Brown/Yellow	150V or more
Brown/White	Brown/Black	150V or more

NOTE: The readings should rapidly increase as the engine RPM increases and stabilize below 400 volts (voltage exceeding 400 V DVA indicates a bad pack). A sharp drop in voltage right before the miss becomes apparent usually indicates a bad stator charge coil.

2. Connect an inductive tachometer to the spark plug wires one at a time and compare the readings. If most of the cylinders show the same reading and one or two show different readings, check the primary wires with the inductive pickup to see if the readings are the same coming out of the power pack. A difference in RPM readings between the primary and secondary coil wires indicate bad ignition wires or coils. No difference usually indicates a defective power pack.

## QUICKSTART IS NOT WORKING

1. Verify engine RPM, QuickStart will not function above 1400 RPM for power packs.
2. Verify the engine timing at idle and over 1500 RPM. Idle timing will normally be around 10 Deg BTDC while in QuickStart. If the timing is around 4-7 Degrees ATDC, QuickStart is not active.
3. Using the Piercing Probes and DVA adapter, check the DVA voltage while connected as follows:

Red Lead	Black Lead	DVA
Orange	Orange/Black	11-24V
Black/White (Timer Base)	Engine Ground	6-12 V
Yellow/Red	Engine Ground	9 V minimum

4. With the engine above 105 degrees F, check the White/Black temperature switch. It should show a short to engine ground. To verify the temperature switch is bad, short the White/Black wire from the power pack to engine ground and retest the engine. If the QuickStart is now working, the switch is bad.

## ENGINE STUCK IN QUICKSTART:

1. Verify the engine has advanced timing at idle and over 1500 RPM (with the White/Black wire from the pack shorted to eng ground). Idle timing will normally be around 10 Degrees BTDC while in QuickStart. If the timing is around 4-7 Degrees ATDC, QuickStart is not active.
2. With the White/Black Temp wire to engine ground, check the DVA voltage on the Black/White wire going to the timer base. You should see 6-10 volts at cranking and voltage dropping off to less than 2 volts within 10 seconds after the engine starts and runs.
3. If the voltage on the Black/White wire does not drop off, check the Yellow/Red wire for 2-7 volts while the engine is running. A voltage over 2 volts, but less than 7 volts may lock in QuickStart. But, will not engage the starter solenoid.



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## ENGINE WILL NOT STOP RUNNING:

1. Connect an adjustable spark tester (set to a 3/8 inch air gap) to all of the spark plug wires.
2. Disconnect the Black/Yellow stop wires from the power pack and short them to engine ground. Check for spark on all cylinders.
  - a. If you do not have spark on any cylinder, reconnect the Black/Yellow stop wires from the power pack to the harness. Disconnect the engine harness and connect a 511-6996 remote starter to the engine and recheck for spark. If the engine now has spark, the problem is likely in the ignition switch or boat-side harness. If there is still no spark, replace the engine harness.
  - b. If you have spark on any cylinders, replace the power pack.