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: 133-3853

This unit replaces P/N's: 583853, 584363, and 763774.

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 (Champion QL77JC4) gapped at 0.030".

These engines use a gear Reduction starter which results in a lower cranking RPM than usual. If you have one or more cylinders intermittently sparking at cranking speed, start the engine and checking to see if ALL of the cylinders now spark correctly. If so, the engine's ignition system is working properly. Make sure the battery is sized correctly as the cranking capacity can affect the cranking speed. These engines should have a minimum 850 CCA flooded wet non-maintenance free marine cranking battery.

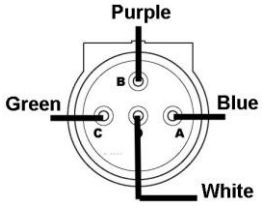
INSTALLATION

1. Disconnect the Negative battery cable.
2. The Power Pack will need to be unbolted in order to disconnect the Timer Base connector that is positioned behind the Power Pack.
3. Disconnect the connector for the old Timer Base.
4. Remove the flywheel according to the service manual for your engine.
5. Remove the Stator and old Timer Base.
6. Lubricate the inside area of the new Timer Base where the White glide ring goes and the area where the inside of the new Timer Base contacts the upper bearing carrier.
7. Install the White glide ring on the new Timer Base.
8. Compress the White glide ring and seat the new Timer Base into the bearing carrier.
9. Make sure the Timer Base is fully seated and secure the glide ring using the retainers removed during disassembly.
10. Remove the bushing link kit from the old Timer Base link arm and install it in the new Timer Base arm.
11. Connect the linkage to the new Timer Base.
12. Re-install the Stator and Flywheel according to the Service Manual for your engine.
13. Reconnect the Negative battery cable.
14. Adjust the ignition timing according to the Service Manual for your engine.

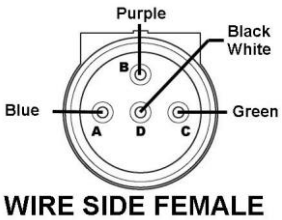
TROUBLESHOOTING

ENGINE WILL NOT START OR MISFIRES:

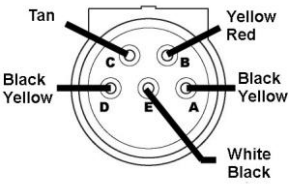
1. Verify the wiring in the connectors as follows:



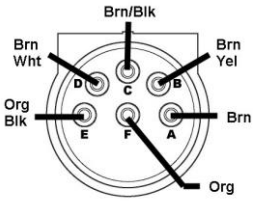
WIRE SIDE MALE



WIRE SIDE FEMALE



WIRE SIDE MALE



WIRE SIDE MALE

NO SPARK ON ANY CYLINDER:

1. Disconnect both of the Black/Yellow stop wires 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. Perform a visual inspection of all ground wire connections to make sure that they are clean and tight.
3. Check all of the Amphenol connectors of each component to assure that all of the pins are seated securely in the connectors and that the pins themselves are clean and free of corrosion.
4. Disconnect the Yellow wires from the Stator to the Voltage Regulator and retest. If the engine now has spark, replace the Voltage Regulator.
5. 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.
6. Check the Timer Base and Charge coil magnets in the flywheel. A loose or broken magnet can cause this problem.

7. Check the Stator and Timer Base DVA and resistance as given below:

Read from	Read to	Ohms	DVA (Connected)	DVA (Disconnected)
Brown (Stator)	Brown/Yellow (Stator)	850-1100 Ω	150-400 V	150-400 V
Brown/Black (Stator)	Brown/White (Stator)	850-1100 Ω	150-400 V	150-400 V
Orange (Power Coil)	Orange/Black (Power Coil)	90-110 Ω	11-22 V	45-120 V
White (Common)	Blue (#2 Timer Base) (a)	1-5 MΩ	100-400 V	0.6 V Minimum
White (Common)	Purple (#4 Timer Base) (a)	1-5 MΩ	100-400 V	0.6 V Minimum
White (Common)	Green (#6 Timer Base) (a)	1-5 MΩ	100-400 V	0.6 V Minimum
White (Common)	Blue (#1 Timer Base) (b)	1-5 MΩ	100-400 V	0.6 V Minimum
White (Common)	Purple (#3 Timer Base) (b)	1-5 MΩ	100-400 V	0.6 V Minimum
White (Common)	Green (#5 Timer Base) (b)	1-5 MΩ	100-400 V	0.6 V Minimum
White (Common)	Black/White (Quick Start) (b)	215-230 Ω	6-10 V (c)	6-10 V (from Power Pack)

(a) Connector with the Solid White wire
(b) Connector with the Black/White wire
(c) DVA will drop below 1 V when the engine drops out of Quick Start (engine is over 104° or 1200 RPM)

NO SPARK OR INTERMITTENT SPARK ON ONE OR MORE CYLINDERS:

1. Check the cranking RPM. A cranking speed of less than 250 RPM will not allow the system to spark properly. This is usually caused by a weak battery or dragging starter. This can be caused by a weak battery, dragging starter, bad battery cables, or a mechanical problem inside the engine.
2. Check the DVA on the Orange Primary wires from the Power Pack while connected to the Ignition coils. You should have a reading of at least 150 V or more. If the reading is low on one cylinder, disconnect the Orange Primary 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.
3. Check the Timer Base resistance and DVA (see **NO SPARK ON ANY CYLINDER**).
4. Check the Power Pack resistance given below:

Read from	Read to	Resistance
Orange/Blue (#1 Primary wire)	Blue (#1 Timer Base input) (b)	110 Ω
Orange/Blue (#2 Primary wire)	Blue (#2 Timer Base input) (a)	110 Ω
Orange (#3 Primary wire)	Purple (#3 Timer Base input) (b)	110 Ω
Orange (#4 Primary wire)	Purple (#4 Timer Base input) (a)	110 Ω
Orange/Green (#5 Primary wire)	Green (#5 Timer Base input) (b)	110 Ω
Orange/Green (#6 Primary wire)	Green (#6 Timer Base input) (a)	110 Ω
White (Timer Base Common)	Black (Engine Ground)	Shorted
Brown (Stator)	Black (Engine Ground)	Open or M range
Brown/Yellow (Stator)	Black (Engine Ground)	Open or M range
Brown/White (Stator)	Black (Engine Ground)	Open or M range
Brown/Black (Stator)	Black (Engine Ground)	Open or M range
Orange (Power Coil)	Black (Engine Ground)	Open or M range
Orange/Black (Power Coil)	Black (Engine Ground)	Open or M range

(a) Connector with the solid White wire
(b) Connector with the Black/White wire

5. Check the spark plug wires for breaks and abrasions.
6. Visually inspect the Ignition coils for burned or discolored areas and cracks in the casing (indicating arcing inside the coil).
7. Swap the Ignition coil with one that is sparking properly.
8. Rare causes include a weak Timer Base magnet. If possible, try another flywheel.

NO SPARK OR INTERMITTENT SPARK ON ONE BANK:

1. Disconnect the Black/Yellow stop wire plug 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. Perform a visual inspection of all ground wire connections to make sure that they are clean and tight.
3. Check all of the Amphenol connectors of each component to assure that all of the pins are seated securely in the connectors and that the pins themselves are clean and free of corrosion.
4. Swap the Stator Amphenol connectors from one side to the other (do not remove the wires from the connectors). If the problem moves, the issue is most likely in the effected Stator Amphenol connector or the Stator itself.
5. Disconnect the Yellow wires from the Stator to the Voltage Regulator and retest. If the engine sparks, replace the Voltage Regulator.
6. Check the Stator and Timer Base DVA (see **NO SPARK ON ANY CYLINDER**).

7. Check the cranking RPM. A cranking speed of less than 250 RPM will 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 DVA on the Orange Primary wires from the Power Pack while connected to the Ignition coils. You should have a reading of at least 150 V minimum.

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 specifications, the Ignition coil is likely defective. If it still measures low, it indicates a bad Power Pack if Timer Base test good.

ENGINE WILL NOT STOP (KILL):

1. Disconnect the Black/Yellow wires at the Power Pack. Connect a jumper wire to the stop wires 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.

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. 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**).
2. Replace the Ignition coil on the cylinder dropping spark.

ENGINE DIES WHEN QUICK START DROPS OUT:

1. Check base ignition timing at idle with the White/Black temperature from the temperature sensor to the Power Pack disconnected. Remember to allow for the drop in ignition timing when Quick Start disengages. The timing will be about 10-15° BTDC while in Quick Start. Verify ignition timing after engine has warmed up, according to the service manual.

ENGINE WILL NOT STAY IN QUICKSTART OVER 10 SECONDS:

1. Verify the engine temperature is below the trip point (89° on some engines and 104° on others) of the temperature switch.
2. Disconnect the White/Black Temperature Switch wire FROM the Port Temperature Switch. If the engine now stays in QuickStart, the Temperature Switch is likely defective.

ENGINE STAYS IN QUICK START ON ALL CYLINDERS:

1. With the engine idling, check the Yellow/Red wire for DC voltage. If there is DC voltage on this wire while the engine is running, the Quick Start will not disengage. A voltage of less than 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 going to the Timer Base from the Power Pack. If the Quick Start feature is now not working, replace the Power Pack.
4. If the Quick Start feature is still active, replace the Timer Base.

ENGINE WILL NOT ENGAGE QUICK START:

1. Disconnect the White/Black wire from the temperature sensor.
2. With the engine idling, check the Black/White Timer Base wire for DC voltage. There should be 6-10 VDC on this wire while the engine is running for the Quick Start to engage.
3. Short the White/Black Temperature Switch wire FROM the Power Pack to engine ground. If the voltage on the Black/White wire drops out after approximately 5 seconds but the engine timing does not change, replace the Timer Base. If the voltage remains present, disconnect the Yellow/Red wire to the Power Pack and repeat the test. If the voltage still remains, replace the Power Pack. If the voltage goes away, check for voltage on the Yellow/Red. If there is any voltage on the Yellow/Red, there is a potentially a fault with the key switch or the starter solenoid.

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

1. Use a temperature probe and verify that the engine is not overheating.
2. 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, the VRO Pump, remote oil tank, blocking diode built into the engine harness, and System Check Gauge.
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. Retest. If no change, the Power Pack is likely defective.

ENGINE ENGAGES S.L.O.W. WHEN THE NO OIL, LOW OIL, OR FUEL VACUUM ALARM SOUNDS:

1. Disconnect engine harness.
2. Disconnect the Tan wires from the temperature sensors in both cylinder heads.
3. Using an Multi Meter set on Diode scale, check the diode in the engine harness as follows:

Red Meter Lead	Black Meter Lead	Reading
Tan pin in Engine Harness Connector	Tan Lead from Port Cyl Head	Reading*
Tan pin in Engine Harness Connector	Tan Lead from Starboard Cyl Head	Reading*
Tan Lead from Starboard Cyl Head	Tan pin in Engine Harness Connector	Open*
Tan Lead from Port Cyl Head	Tan pin in Engine Harness Connector	Open*

**** This Measurement is with the meter set to the diode scale. Where you see the term "Reading" represents a reading on the meter. Where you see the term "Open" represents no value showing on the meter.***

NOTE: You can replace the diode in the harness with a 1N4007 diode available at most electronics stores.