



# Installation and Troubleshooting Guide

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**CDI P/N: 133-3533**

**Note: This unit replaces P/Ns: 583533, 584586, 763775.**

**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 Negative battery cable.
2. Remove the power pack.
3. Disconnect the old Timer Base.
4. Remove the flywheel, stator and old Timer Base.
5. Lubricate the inside area of the new Timer Base where the White slip ring goes and the area where the inside of the new Timer Base contacts the upper bearing carrier.
6. Install the White slip ring on the new Timer Base.
7. Compress the White slip ring and seat the new Timer Base into the bearing carrier.
8. Make sure the Timer Base is fully seated and secure the slip ring using the retainers removed during disassembly.
9. Remove the bushing link kit from the old Timer Base link arm and install it in the new Timer Base arm.
10. Connect the linkage to the new Timer Base.
11. Re-install the Stator and Flywheel according to the Service Manual.
12. Start and run the engine, adjusting the ignition timing according to the Service Manual. Remember to allow the engine to warm up before adjusting the timing.

## TROUBLESHOOTING THE TIMER BASE

**Service Note: Please use the Factory recommended spark plug (currently Champion 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 to you or your pocketbook. It is a 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 black/yellow kill wires AT THE PACK and retest. If the engine's ignition now has fire, the kill 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 fires, replace the rectifier.
3. Check the DC voltage on the Black/White wire going to the Timer Base. You should have 6-12 volts at cranking. No reading may mean a bad stator.
4. Check the stator and trigger resistance and DVA output as given below for each bank:

Wire Color	Check to Wire Color	Resistance	DVA Reading
Brown wire	Brown/Yellow wire	900-1100 (35 amp)	150V or more Connected
Orange	Orange/Black	93-103 OEM	12-24V Connected
Orange	Orange/Black	45-55 CDI	12-24V Connected
White wire	Purple wire	(a)	0.6V or more Connected
White wire	Blue wire	(a)	0.6V or more Connected
White wire	Green wire	(a)	0.6V or more Connected
White wire	Purple wire 2 <sup>nd</sup> connector	(a)	0.6V or more Connected
White wire	Blue wire 2 <sup>nd</sup> connector	(a)	0.6V or more Connected
White wire	Green wire 2 <sup>nd</sup> connector	(a)	0.6V or more Connected
White wire	Black/White wire 2 <sup>nd</sup> connector	215-225	5 V or more Connected

(a) Use a comparison reading as different brands of meters will give different readings. The typical range is 1M to 5M ohms. As long as you have approximately the same ohm reading on all six tests and the correct output with the DVA meter, the Timer-Base should be good. The exception would be if one of the scr's inside the Timer-Base is breaking down while the engine is running. This can be found indexing the flywheel and checking the timing on all cylinders. If the readings are off, reverse the meter leads and retest to see if the readings are corrected.

2. Check the center hub triggering magnet in the flywheel. A loose magnet can cause this problem.
3. Check the cranking RPM. A cranking speed of less than 250-RPM will not allow the system to fire properly. This can be caused by a weak battery, dragging starter, bad battery cables or a mechanical problem inside the engine.

### NO SPARK ON ONE CYLINDER:

**NOTE:** These engines use a gear reduction starter which results in a lower cranking RPM than usual. If you have one or more cylinders intermittent at cranking: Try starting the engine and checking to see if ALL of the cylinders now fire correctly. If so, the engine's ignition should be good. Make sure the battery is sized correctly as the cranking capacity can affect the cranking speed.

1. Check the timer base's resistance and output (see NO SPARK ON ANY CYLINDER above).
2. 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 130V or more. If the reading is low on one cylinder, disconnect the orange wire from the ignition coil for that cylinder and



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reconnect it to a load resistor. Retest. If the reading is now good, the ignition coil is likely bad. A continued low reading indicates a bad power pack or Timer-Base.

3. Check the power pack resistance given below:

Wire Color	(CYL)	Check to Wire Color	Resistance
Orange/Blue	(#1)	Blue (in 4 pin connector with Black/White wire)	110 (a)
Orange	(#3)	Purple (in 4 pin connector with Black/White wire)	110 (a)
Orange/Green	(#5)	Green (in 4 pin connector with Black/White wire)	110 (a)
Orange/Blue	(#2)	Blue (in 4 pin connector with White wire)	110 (a)
Orange	(#4)	Purple (in 4 pin connector with White wire)	110 (a)
Orange/Green	(#6)	Green (in 4 pin connector with White wire)	110 (a)
White		Black (Engine Ground)	Shorted

(a) Use a comparison reading as different brands of meters will give different readings. The typical range is 90 to 150 ohms for the Orange wires. You should have approximately the same ohm reading on all six 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.

4. Check the spark plug wires for breaks and abrasions.

## NO SPARK ON ONE BANK:

1. Disconnect the black/yellow kill wires AT THE PACK and retest. If the engine's ignition now has fire, the kill circuit has a fault-possibly the key switch, harness or shift switch.
2. Swap the Brown stator connectors from side to side (do not remove the wires from the connectors). If the problem moves, replace the stator.
3. Check the stator and trigger resistance and DVA output as given below for each bank:

Wire Color	Check to Wire Color	Resistance	DVA Reading
Brown wire	Brown/Yellow wire	900-1100 (35 amp)	150V or more Connected
Orange	Orange/Black	93-103 OEM	12-24V Connected
Orange	Orange/Black	45-55 CDI	12-24V Connected
White wire	Purple wire	(a)	0.6V or more Connected
White wire	Blue wire	(a)	0.6V or more Connected
White wire	Green wire	(a)	0.6V or more Connected
White wire	Purple wire 2 <sup>nd</sup> connector	(a)	0.6V or more Connected
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White wire	Green wire 2 <sup>nd</sup> connector	(a)	0.6V or more Connected
White wire	Black/White wire 2 <sup>nd</sup> connector	215-225	5 V or more Connected

(a) Use a comparison reading as different brands of meters will give different readings. The typical range is 1M to 5M ohms. As long as you have approximately the same ohm reading on all six tests and the correct output with the DVA meter, the Timer-Base should be good. The exception would be if one of the scr's inside the Timer-Base is breaking down while the engine is running. This can be found indexing the flywheel and checking the timing on all cylinders. If the readings are off, reverse the meter leads and retest to see if the readings are corrected.

4. 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 all of the ignition coils are likely bad. A continued low reading indicates a bad power pack.

## 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 pack and retest. If the engine now performs properly, test and replace the defective temperature switch.
3. Make sure the tan temperature switch wire is not located next to a spark plug wire.
4. Disconnect the VRO sensor from the engine harness and retest. If the engine performs correctly, replace the VRO or sensor.

## ENGINE DIES WHEN QUICKSTART DROPS OUT:

Check ignition timing at idle with the White/Black temperature wire disconnected. Remember to allow for the drop in ignition timing when Quick Start disengages. Verify ignition timing after engine has warmed up, according to the service manual.

## ENGINE STAYS IN QUICKSTART:

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 volts 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 DC voltage. There should be about 6 to 10 volts DC voltage 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 pack and repeat the test. If the voltage still remains, replace the pack.

Thank you for using CDI Electronics.