Installation and Troubleshooting Guide

CDI P/N: 133-4804

Note: This unit replaces P/Ns: 584804, 763773.

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. Disconnect the old Timer Base and remove the flywheel, stator and old Timer Base.
3. 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.
4. Install the White slip ring on the new Timer Base and compress the White slip ring and seat the new Timer Base into the bearing carrier.
5. Make sure the Timer Base is fully seated and secure the slip ring using the retainers removed during disassembly.
6. Remove the bushing link kit from the old Timer Base link arm and install it in the new Timer Base arm.
7. Connect the linkage to the new Timer Base.
8. Re-install the Stator and Flywheel according to the Service Manual and reconnect the negative battery cable.
9. Start and run the engine, adjusting the ignition timing according to the Service Manual.

TROUBLESHOOTING

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

NO SPARK ON ANY CYLINDER:

1. Disconnect the Black/Yellow stop wire AT THE POWER PACK and retest. If the engine's ignition has spark, the stop circuit has a fault. Check the key switch, harness and shift switch.
2. Disconnect the Yellow wires from the rectifier and retest. If the ignition now has spark, replace the rectifier.
3. 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.
4. Inspect and clean all engine and ignition ground connections.
5. Check the stator and timer base resistance and DVA output as given below:

WIRE	READ TO	RESISTANCE (Disconnected)	DVA (Connected)	DVA (Disconnected)
Brown	Brown/Yellow	450-550	150 V +	150 V + (*)
Orange	Orange/Black	450-550 (CDI 45-55)	11-22 V	45-120 V (*)
White	Purple	(^)	100 V + (a)	0.6 V + (#)
White	Blue	(^)	100 V + (a)	0.6 V + (#)
White	Green	(^)	100 V + (a)	0.6 V + (#)
White	Black/White	400-500	6 -10 V (b)	6 -10 V (from pack)

(*) This reading can be used to determine if a stator or pack has a problem. For instance, if you have no spark on any cylinder and the stator's DVA reading is out of spec – disconnect the stator wires and recheck the DVA output. If the reading is still out of spec – the stator is bad. If the reading is now within spec – the pack is bad.

(#) This reading can be used to determine if a pack has a problem in the triggering circuit. For instance, if you have no spark on one cylinder and the timer base's DVA reading for that cylinder is low – disconnect the timer base wires and recheck the DVA output. If the reading stays low – the timer base is bad. If the reading is now within spec – the pack is likely bad.

(^) This reading will vary according to the meter used. Do a comparison reading and if there is a difference of over 10%, replace the timer base. Typically, use the Red meter lead to the White wire and the Black meter lead to the other wires. The Fluke series meters will typically read 1 MΩ to 2.4 MΩ while the CDI 511-60 meter will read about 5 MΩ.

(a) This reading will be only approximately 0.6-1.5 volts if the SCR inside the pack is not firing. You will read 100 to 200 volts depending upon your meter and the voltage generated by the stator if the SCR in the pack is firing out to the ignition coil (due to the bypass filter cap inside the pack).

(b) Voltage will drop below 1 volt when engine drops out of QuickStart (engine is over 104 Deg or 1200 RPM).

6. Check the center hub triggering magnet in the flywheel. A loose magnet can cause this problem.
7. Check the triggering and charge coil flywheel magnets for cracked, broken and loose magnets.

NO SPARK OR INTERMITTENT SPARK ON ONE OR MORE CYLINDERS:

1. Check the stator and timer base resistance and DVA 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 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 load resistor. Retest. If the reading is now good, the ignition coil is likely bad. A continued low reading indicates a bad power pack if the timer base checks OK.
3. Visually inspect the ignition coils for burned or discolored areas and cracks in the casing (indicating arcing inside the coil).

4. Swap the ignition coil with one that is firing correctly.
5. Rare causes include a weak trigger magnet. If possible, try another flywheel.
6. Check the power pack resistance given below:

WIRE	(CYL)	READ TO	Resistance
Orange/Blue	(#1)	Blue	110 (a)
Orange	(#2)	Purple	110 (a)
Orange/Green	(#3)	Green	110 (a)
White		Black (Engine Ground)	Shorted
Brown & Brown/Yellow		Black (Engine Ground)	Open or M range

(a) Use a comparison reading as different brands of meters will give different readings. The typical range is 90 to 180 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.

MISS AT ANY RPM:

1. Disconnect the Yellow wires from the stator to the rectifier and retest. If the miss clears, replace the rectifier.
2. In the water or on a Dynameters, 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 DVA or more, increasing with engine RPM until it reaches 300-400V 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.
3. 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 voltage (see NO SPARK ON ANY CYLINDER above).
4. 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.
5. Check the triggering and charge coil flywheel magnets for cracked, broken and loose magnets.

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

1. If the warning horn is sounding: 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, the fault is likely in the temperature switch, engine harness, VRO (if equipped), boat harness or possibly the System Check gauge.
3. If no horn: Make sure the Tan temperature switch wire is not located next to a spark plug wire (RF interference can activate the SLOW function).

ENGINE DIES WHEN QUICK-START 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.

ENGINE STAYS IN QUICK-START:

1. With the engine idling, check the Yellow/Red wire for DC voltage. If there is DC voltage over 2 volts on this wire while the engine is running, the Quick-Start will not disengage. A voltage of 5 to 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 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 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.

ENGINE TIMING TOO HIGH:

1. Check the flywheel center hub magnet to make sure it's tight. Look for signs of cracks and bulges in the Brown ferret magnet material.
2. Short the White/Black temp wire to engine ground and see if the timing drops back to normal.
3. Check the DC voltage on the Black/White wire going to the timer base. When the White/Black temp wire is shorted to engine ground, the voltage should drop out. If the voltage on the Black/White wire stays in the 6-10 volt range, disconnect the Yellow/Red wire from the power pack. The voltage should drop out on the Black/White wire. If it does, the harness or starter solenoid is likely defective. If the voltage on the Black/White wire stays in the 6-10 volt range with the Yellow/Red wire disconnected and the White/Black wire shorted to engine ground, the power pack is defective.

TECHNICAL SERVICE BULLETIN

Reference Information OMC Outboard Service Bulletin 2276 Rev 1 April 1994

No. 032510
Mar, 2003

Subject:	**Engine Over-Heating**			
Make:	**Johnson & Evinrude**			
Horsepower:	**50 HP**	**60 HP**	**65 HP**	**70 HP**
Years:	**1986-94**	**1986-94**	**1987-94**	**1989-94**

Problem: The engine and electrical system can become damaged due to over-heating when air is trapped in the upper half of the cooling system. Trapped air can cause the upper cylinder or regulator/rectifier to overheat, resulting in damage to the piston or the regulator/rectifier (possibly burning out and damaging the stator also).
Air can become trapped when:
1. The engine is idling with a blocked or restricted thermostat bypass hole.
2. The engine is operated in aerated water, such as a pontoon or deck boat wakes.

Solution: Relocate the water pump indicator outlet tee (for the pee tube) from the side of the engine block to the top of the engine block. This allows air to be vented from the top of the cooling system and helps ensure an adequate water level when idling.

If the engine does not have a threaded hole located in the top of the cylinder block, please follow the steps below:

1. Remove the indicator hose from the outlet tee and discard it.
2. Remove the outlet tee.
3. Install a 1/8th NPT Brass pipe plug into the hole where the tee was located (use Gelseal on the threads).
4. Measure 2 inches forward from the rear corner of the exhaust manifold cover(ref “A”) and 1-3/8 inches from the exhaust cover gasket (ref “B”. Mark the intersection with a center punch (see figure 2).
5. Mark an 11/32nd (Letter “R”) drill bit ½ inch from the tip (to prevent damage to the water jacket) as a depth gauge. Grease the tip of the drill bit and drill a hole through the casting. The grease will help prevent metal shavings from entering the cooling system.
6. Grease the tip of an 1/8 inch NPT tap and thread the hole. Be careful to not over tap the hole (over tapping may not allow the adapter from sealing off).
7. Apply Gel Seal to the threads of the original tee and install it into the hole you just tapped. Position the tee so the nipple is facing the rear of the engine.
8. Install a new piece of 3/16th rubber hose (19 inches long) from the tee to the indicator.