



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: 114-7509

This CDM Module replaces all 827509A1, 827509A3, 827509A7, 827509A9, 827509A10 and 827509T4 series CDM Modules

Warning! This product is designed for installation by a professional marine mechanic. CDI cannot be held liable for injury or damage resulting from improper installation, abuse, neglect or misuse of this product.

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

- DC voltage present on the kill circuit of the CDM Modules due to a faulty key switch, boat harness, or engine harness will severely damage the CDM Module's internal kill circuit. Disconnect the CDM wiring harness at the CDM's on ALL OF THE CDM Modules at the same time. Connect a Digital Multi Meter to the Ignition Stop wires (Black/Yellow) at the CDM's by way of the plug connectors of the CDM Harness. Use the Black/Yellow wires in reference to a known good engine ground (Black wire in CDM plug connector). Turn the Ignition switch on and off several times. If, at any time, you see over 2 VDC on the kill wire(s), there is a problem with one or both harnesses and/or the Ignition switch. The Ignition Stop wire should not be connected back to ANY CDM Module at any point until the problem is corrected **OR DAMAGE TO THE CDM MODULE'S WILL OCCUR!**

INSTALLATION

- Disconnect and clean all engine and battery ground wires.
- Disconnect the old CDM Module and remove the high tension coil wire from the spark plug.
- Unbolt and remove the old CDM Module. (Note the direction of the spark plug wire).
- Apply a light amount of dielectric grease to the seal area of the wire connector from the engine harness.
- Apply a light amount of dielectric grease to the outside of the new spark plug wire and thread the spark plug wire into the new CDM Module.
- Bolt the new CDM Module onto the engine (orient the new CDM Module so that the spark plug wire is pointed in the same direction as the original).
- Plug in the connector from the wire harness into the new CDM Module and connect the spark plug wire to the spark plug.

GENERAL TROUBLESHOOTING

NO SPARK:

- Disconnect the Black/Yellow kill wires from the harness 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).
- Install a 511-5207A 1 test harness inline to one of the CDM Modules and unplug the Black/Yellow wires in the harness. This will isolate that CDM from all other connections. If spark returns on that CDM with the Black/Yellow wires unplugged, test the remaining CDMs. If you disconnect one CDM and all other CDMs start firing, the one that the test harness is connected to is defective. Remember, the fault could be in the CDM harness.
- Disconnect one CDM module one at a time and see if the other modules start firing. If they do, the module you just unplugged is defective.
- Disconnect the Yellow wires from the Stator to the Regulator/Rectifier and retest. If the engine fires, replace the Regulator/Rectifier.
- Check the Resistance of the Black wire in the 4 pin connector to the CDM in reference to a good clean engine ground. It should show a short, less than 0.5 Ω . A high reading or an open reading indicates a break in the Black wire. Check the wire at the ground terminal.
- Check the cranking RPM. A cranking speed less than 250 RPM will not allow the system to fire properly.
- Check the Stator and Trigger resistance and DVA. (see your applicable engine category)
- Check the resistance and diodes of each of the CDM modules as follows:

	Red Meter Lead	Black Meter Lead	OEM Reading	CDI Reading
CDM Pin #	(A) Ground	(C) Trigger	1.2-1.4K Ω	1.2-1.4K Ω
CDM Pin #	(D) Stator	(A) Ground	Open*	Open*
CDM Pin #	(A) Ground	(D) Stator	Reading*	Reading*
CDM Pin #	(D) Stator	(B) Kill Circuit	Reading*	Reading*
CDM Pin #	(B) Kill Circuit	(D) Stator	Open*	Open*
CDM Pin #	(A) Ground	(B) Kill Circuit	Reading*	Reading*
CDM Pin #	(B) Kill Circuit	(A) Ground	High M Ω or Open*	High M Ω or Open*
-	High Tension Lead	(A) Ground	0.7-1.3K Ω	2.2-2.4K Ω

*** 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.**

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INTERMITTENT SPARK OR NO SPARK ON ONE OR MORE CYLINDERS:

1. Check the resistance of the Black wire in the 4 pin connector to the CDM in reference to a good clean engine ground. It should show a short, less than 0.5 Ω . A high reading or an open reading indicates a break in the Black wire. Check the wire at the ground terminal.
2. If the cylinders are only acting up above an idle, connect an inductive Tachometer to all cylinders and try to isolate the problem cylinders.

2 CYLINDER TROUBLESHOOTING

INTERMITTENT SPARK OR NO SPARK ON ONE OR MORE CYLINDERS:

1. Check the Stator resistance and DVA as given below:

Read from	Read to	OEM Ohms	CDI Ohms	DVA (Connected)	DVA (Disconnected)
White/Green (Stator)	Green/White (Stator)	500-700 Ω	400-550 Ω	180-400 V	200-400 V

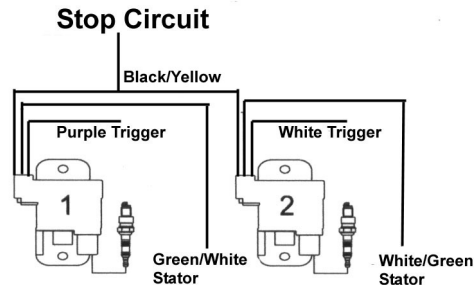
2. Check the Trigger DVA as shown below:

Read from	Read to	Ohms	DVA Connected	DVA Disconnected
Purple wire (#1 Trigger)	Engine Gnd	Open	0.5-1.5 V**	5 V or more
White wire (#2 Trigger)	Engine Gnd	Open	0.5-1.5 V**	5 V or more

**A DVA reading that is close to the same reading connected as disconnected may indicate a broken ground wire.

NOTE: As these Triggers have the Bias circuit built into them, you cannot meter them. Using a set of piercing probes, check the Trigger DVA as given below:

3. If one cylinder is not sparking, swap the White/Green and Green/White Stator wires and retest. If the problem moves to the other cylinder, the Stator is likely bad. If no change, replace both CDMs. A continued no spark condition on the same cylinder indicates a bad Trigger.
4. If # 1 is not firing, disconnect #2 CDM module. Check to see which Stator wire feeds #2 CDM and by using a jumper wire, short that side of the Stator to engine ground. If # 1 starts firing, replace the #2 CDM.
5. For #2 CDM not firing, short the Stator wire that feeds the #1 CDM. Again, if the #2 CDM starts firing, replace the #1 CDM.



3 CYLINDER TROUBLESHOOTING

NO SPARK OR INTERMITTENT SPARK ON ONE OR MORE CYLINDERS:

1. Inspect the spark plug wires, boots, and spark plugs. Check for chafing on the wiring and harnesses.
2. Clean and inspect CDM ground wire connections to engine ground.
3. Check the Stator resistance and DVA as given below:

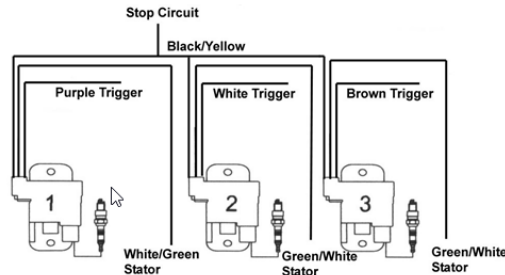
Read from	Read to	OEM Ohms	CDI Ohms	DVA (Connected)	DVA (Disconnected)
White/Green	Green/White	500-700 Ω	400-550 Ω	180-400 V	200-400 V

4. Check the Trigger DVA as shown below:

Read from	Read to	Ohms	DVA (Connected)
Purple (#1 Trigger)	Engine Gnd	Open	1 V Minimum
White (#2 Trigger)	Engine Gnd	Open	1 V Minimum
Brown (#3 Trigger)	Engine Gnd	Open	1 V Minimum

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- If (#1) or (#3) or (#1 and #2) or (#2 and #3) is not sparking, swap the White/Green and Green/White Stator wires and retest. If the problem moves to the other cylinder(s), the Stator is likely bad. If no change, replace all CDMs. A continued no spark condition on the same cylinder(s) indicates a bad Trigger.
- If #1 CDM module is not sparking, disconnect the #2 CDM module and see if the #1 CDM module starts sparking. If it does, the module you just unplugged is bad. If it does not, reconnect #2, then disconnect the #3 CDM module and see if the #1 module starts sparking. If it does, the module you just unplugged is bad.
- If there is no spark on either # 2 or #3, swap locations with #1 and see if the problem moves. If it does, the module is bad. A continued no spark on the same cylinder indicates a bad Trigger.
- If the cylinders are only misfiring above an idle, connect an inductive tachometer to all cylinders and try to isolate the problem cylinders.
- Check the resistance of each of the CDM modules.



4 CYLINDER TROUBLESHOOTING

NO SPARK OR INTERMITTENT SPARK ON ONE OR MORE CYLINDERS:

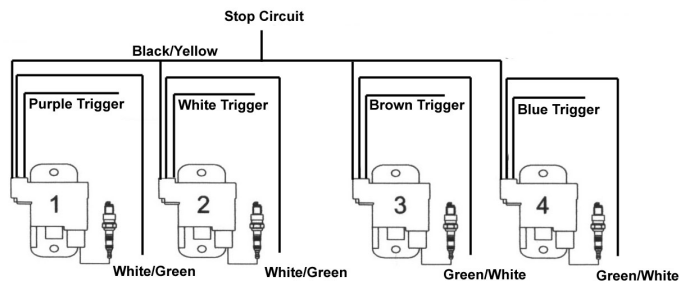
- Inspect the spark plug wires, boots and spark plugs. Check for chafing on the wiring and harnesses.
- Clean and inspect CDM ground wire connections to engine ground.
- Check the Stator resistance and DVA as given below:

Read from	Read to	OEM Ohms	CDI Ohms	DVA (Connected)	DVA (Disconnected)
White/Green (Stator)	Green/White (Stator)	500-700 Ω	400-550 Ω	180-400 V	200-400 V
Purple (#1 Trigger)	Engine Gnd	Open	Open	1 V Minimum	-
White (#2 Trigger)	Engine Gnd	Open	Open	1 V Minimum	-
Brown (#3 Trigger)	Engine Gnd	Open	Open	1 V Minimum	-
Blue (#4 Trigger)	Engine Gnd	Open	Open	1 V Minimum	-

- If (#1 and/or #2) or (#3 and/or #4) is not sparking, swap the White/Green and Green/White Stator wires and retest. If the problem moves to the other cylinders, the Stator is likely bad. If no change, replace all CDMs. A continued no spark condition on the same cylinders indicates a bad Trigger.

Note: When moving CDM modules around on the engine, pay attention to the Stator wire colors going to the CDMs. You must have a Green/White and White/Green wire connected or you will lose fire on all CDMs.

- Disconnect the CDM modules one at a time and see if you get spark back on the problem cylinders. If spark returns, replace the CDM you disconnected.
- If the cylinders are only misfiring above an idle, connect an inductive RPM meter to all cylinders and try to isolate the problem cylinders.
- Check the resistance of each of the CDM modules.



2.5 LITER 6 CYLINDER TROUBLESHOOTING

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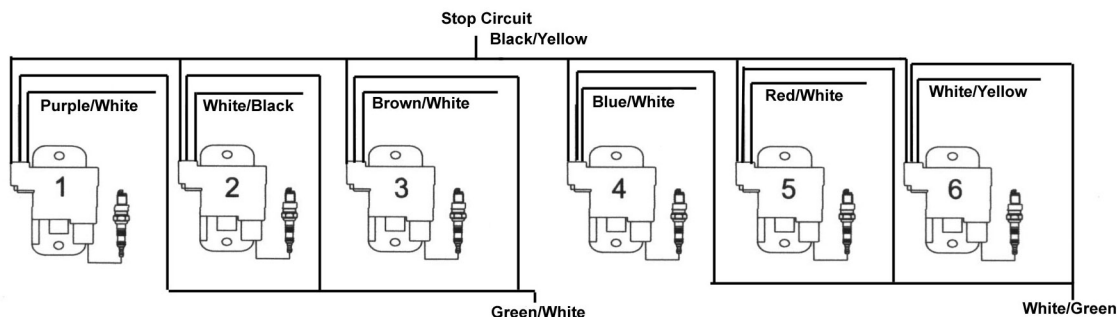
NO SPARK ON ANY CYLINDER:

1. Disconnect the Timing Protection Module's (TPM) 6 pin connectors from the Trigger and CDM Harness.
2. Connect the Trigger directly to the CDM Harness, bypassing the TPM. Remember, the TPM for the Carbureted engines has a built in RPM Limiter. But, the one for the Fuel Injected engines does not.
3. Check for Spark.
4. If Spark is present, check the Purple wire to the TPM. With the key switch on, you should have battery voltage present (above 10 V while cranking). If the voltage is not present, trace the Purple wire back to the key switch and locate the break in the wire.
5. If the spark does not return, check the Stator and Trigger as shown:

Read from	Read to	OEM Ohms	CDI Ohms	DVA (Connected)	DVA (Disconnected)
White/Green (Stator)	Green/White (Stator)	380-430 Ω	380-430 Ω	160-400 V	200-400 V
Purple (#1 Trigger)	Blue (#4 Trigger)	1.1-1.4K Ω	0.85-1.05K Ω	0.4 V Minimum	4 V Minimum
White (#2 Trigger)	Red (#5 Trigger)	1.1-1.4K Ω	0.85-1.05K Ω	0.4 V Minimum	4 V Minimum
Brown (#3 Trigger)	Yellow (#6 Trigger)	1.1-1.4K Ω	0.85-1.05K Ω	0.4 V Minimum	4 V Minimum
Purple (#1 Trigger)	Engine Gnd	Open	Open	0.2 V Minimum	-
White (#2 Trigger)	Engine Gnd	Open	Open	0.2 V Minimum	-
Brown (#3 Trigger)	Engine Gnd	Open	Open	0.2 V Minimum	-
Blue (#4 Trigger)	Engine Gnd	Open	Open	0.2 V Minimum	-
Red (#5 Trigger)	Engine Gnd	Open	Open	0.2 V Minimum	-
Yellow (#6 Trigger)	Engine Gnd	Open	Open	0.2 V Minimum	-

6. If no change, disconnect the CDM modules one at a time and see if you get spark back on the other cylinders. A shorted stop circuit in one CDM can prevent ALL cylinders from sparking.
7. If there is still no spark, disconnect the boat side harness and check for spark. If spark returns, check the key switch, emergency kill switch, and boat side harness.
8. Disconnect the Yellow wires from the Regulator/Rectifier and retest. If the engine has spark, replace the Regulator/Rectifier.
9. 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.
10. Inspect the spark plug wires, boots, and spark plugs. Check for chafing on the wiring and harnesses.
11. Inspect and clean all engine and ignition ground connections. Tug on the ground wires for the CDM Modules against the ring terminal. If the insulation stretches, the wire is broken internally. Replace the original 3 wire ring terminal with individual ring terminals (Solder them on if possible) and add a secondary ground wire (10 or 12 Ga) from the ground point of the CDM Modules and route it around and connect it with the Negative Black Ground Battery cable on the engine.
12. Pull on each wire from each CDM harness plug. Make sure all wires are making proper contact inside plugs.
13. Check the Trigger and Stator coil flywheel magnets for cracked, broken, or loose magnets.

The connection guide below will assist you in locating areas where problems can occur. Remember a short in either #1, #2 or #3 can cause either # 4, #5 and #6 not to have spark on a 2.5L engine.



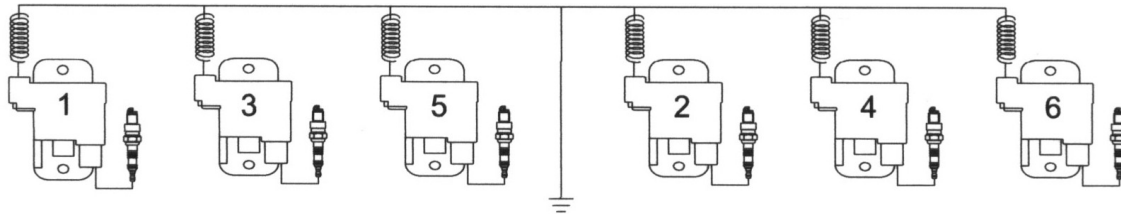
3.0 LITER TROUBLESHOOTING

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NO SPARK OR WEAK SPARK ON ANY CYLINDER:

1. Disconnect the Black/Yellow stop wires from the harness. Retest. If the engine's ignition now has spark, the stop circuit has a fault. Check the key switch, harness, and shift switch.
2. Inspect the spark plug wires, boots, and spark plugs. Check for chafing on the wiring and harnesses.
3. Inspect and clean all engine and ignition ground connections.
4. Check the Stator Harness for loose connections.
5. Check the Alternator for dragging as well as shorted diodes.
6. Check the Crank Position Sensor (CPS) resistance as given below:

Read from	Read to	Ohms
Red	White	0.9-1.3K Ω

7. Adjust the CPS air gap to 0.020 inches.

NO SPARK OR WEAK SPARK ON ONE CYLINDER:

1. Inspect the spark plug wires, boots, and spark plugs. Check for chafing on the wiring and harnesses.
2. Clean and inspect CDM ground wire connection to engine ground.
3. If the cylinders are only misfiring above an idle, connect an inductive RPM meter to all cylinders and try to isolate the problem cylinders.
4. Check the Stator resistance and DVA as given below:

Read from	Read to	Ohms	DVA (Connected)
Green (#1 Cyl)	Engine Gnd	0.99-1.21K Ω	100 V Minimum
Green/Red (#2 Cyl)	Engine Gnd	0.99-1.21K Ω	100 V Minimum
Green/Yellow (#3 Cyl)	Engine Gnd	0.99-1.21K Ω	100 V Minimum
Green/Blue (#4 Cyl)	Engine Gnd	0.99-1.21K Ω	100 V Minimum
Green/Orange (#5 Cyl)	Engine Gnd	0.99-1.21K Ω	100 V Minimum
Green/Black (#6 Cyl)	Engine Gnd	0.99-1.21K Ω	100 V Minimum

HIGH SPEED MISS:

1. Connect an inductive Tachometer to all cylinders and try to isolate the problem. A high variance in RPM on one cylinder indicates a problem usually in the Trigger or CDM module.
2. Perform a high-speed shutdown and read the spark plugs. Check for water. A crack in the block can cause a high speed miss when the water pressure gets high, but a normal shutdown will mask the problem.
3. Remove the flywheel and check the Stator coil flywheel magnets for cracks or broken magnets.