



# Installation and Troubleshooting Guide



NOTE: This installation is to be completed by an Authorized Dealer or Professional Service Technician.

**CDI P/N: 174-0002**

**This stator replaces the following 6 cylinder 40 Amp stators: 398-858404T 3 and 398-858404T 4 Stators.**

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.

**SERVICE NOTE:** If more than one battery charge post winding is burned, please replace both of the rectifier/regulators before installing the stator.

It is recommended that a small amount of dielectric grease (i.e. CDI P/N: 991-9705) be used on the connector's rubber seal.

## INSTALLATION

1. Remove the flywheel.
2. Disconnect the old stator's two wire connector's to the CDM harness and the Regulator/Rectifiers. Save the brackets to reuse with the new stator's connections.
3. Note the position of the mounting screws in relation to where the stator wires come out of the old stator.
4. Remove the old stator.
5. Orient and install the new stator (using a good thread-locker applied to the bolts) in the same position as the old stator on the engine and install the flywheel, following the service manual instructions.
6. Connect the stator's two wire connector to the CDM harness and the two wire connector's to the two Regulator/Rectifier's.
7. Remount the Regulator/Rectifiers using the original bolts and brackets, using the foam to hold the connectors in place.

**SERVICE NOTE:** Due to the reported problems experienced in the field, it is recommended to replace the ground connections for the CDM Modules with individual ring terminals. Clean the grounding points on the mounting plate and run an additional 10 or 12 ga ground wire from the same point as the CDM Module grounds to the Negative battery cable on the engine. Cover the exposed terminals with liquid electrical tape or equivalent.

## TROUBLESHOOTING

### NOT CHARGING THE BATTERY:

1. Check resistance between the yellow wires in each set, you should read approximately 0.3 ohms between the wires in each set.
2. If there is a inline fuse between the regulators and the engine harness, make sure the fuse is not blown and is high enough rated (a 25-30 AMP fuse is recommended).
3. Check the resistance from each yellow wire to engine ground, you should not read any resistance (NOTE: If your fingers are touching both test leads, you will show a high resistance – your body's resistance). Resistance to ground (stator frame) indicates a bad stator.

### NO SPARK ON ANY CYLINDER:

1. 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.
2. Using the CDM Test Harness, connect it to the CDM Modules, one at a time and disconnect the Black/Yellow connectors stop wire in the CDM Test Harness and retest. If the CDM Module you just connected to now has spark, the stop circuit has a fault. Check the key switch, harness and shift switch.
3. Disconnect the Yellow wires from the rectifiers and retest. If the engine has spark, replace the rectifiers.
4. Disconnect the ICM and reconnect the trigger to the CDM harness. If the engine has spark, verify 12V DC on the Purple wire to the ICM. If 12V DC is present, the ICM is faulty. If 12V DC is not present, check the key switch and harness.
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. Inspect the spark plug wires, boots and spark plugs. Check for chafing on the wiring and harnesses.
7. Inspect and clean all engine and ignition ground connections.
8. Pull on each wire from each CDM harness plug. Make sure all wires are making proper contact inside plugs.

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9. Check the stator resistance and DVA output as given below:

WIRE	READ TO	OEM OHMS	CDI OHMS	DVA (Connected)	DVA (Disconnected)
White/Green	Green/White	380-430	380-430	160-400 V	200-400 V (*)

(\*) This reading can be used to determine if a stator or the CDM modules have a problem. For instance, if you have no spark on any cylinder and the stator's DVA reading is low – disconnect the stator wires and recheck the DVA output. If the reading stays low – the stator is bad. If the reading is now within spec – at least one of the CDM modules is bad.

10. Check the resistance of each of the CDM modules as follows:

	RED METER LEAD	BLACK METER LEAD	READING
CDM Pin #	A	C	1200-1400 Ohms
CDM Pin #	D	A	DIODE*
CDM Pin #	A	D	DIODE*
CDM Pin #	D	B	DIODE*
CDM Pin #	B	D	DIODE*
CDM Pin #	A	B	DIODE*
	High Tension Lead	A	OEM 700-1300 Ohms – CDI 2200-2400 Ohms

\* Diode readings are to be read one way, then reverse the leads and read again. You should get a low reading in one direction and a higher reading in the other.

11. 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. 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 trigger resistance and DVA output as given below:

WIRE	READ TO	OEM OHMS	CDI OHMS	DVA (Connected)	DVA (Disconnected at Trigger)
Purple	Blue	1100-1400	850-1050	0.4 V +	4 V + (#)
White	Red	1100-1400	850-1050	0.4 V +	4 V + (#)
Brown	Yellow	1100-1400	850-1050	0.4 V +	4 V + (#)

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

4. Disconnect the CDM modules one at a time and see if you get spark back on the problem cylinders. If it does, replace all defective CDMs.
5. If the cylinders are only misfiring above an idle, connect an inductive RPM meter to all cylinders and try to isolate the problem cylinders.
6. Check the resistance of each of the CDM modules (see NO SPARK ON ANY CYLINDER above).
7. Check the two ground connections for the CDM Modules (each will have 3 Black wires in a single ring terminal located on the CDM Module mounting plate. Firmly pull on the Black ground wires against the ring terminal. If the wire comes out or the terminal seems loose inside the sleeve, replace the single terminal with individual ring terminals. Remove the old ring terminal and clean the mounting area for the ring terminals. Bolt the new ring terminal in place using the original mounting bolt. When the repair is complete, cover the exposed ring terminals with a protective coating like liquid electrical tape or neoprene.

### CDM OR TRIGGER REPEATEDLY BLOWS ON SAME CYLINDER:

1. Check the trigger wires for shorts to engine ground as a shorted trigger wire can destroy a SCR inside the CDM.
2. In contrast, a shorted SCR inside the CDM can destroy a trigger coil. Check the trigger resistance and DVA output (see NO SPARK ON ANY CYLINDER above).
3. Disconnect the 4 pin connector from the CDM with no fire. Check for DC voltage on the Black/Yellow in the 4 pin connector, reference to engine ground. Turn the ignition switch on and off several times. DC voltage should never exceed 2V. If it does, the stop circuit has a fault. Check the key switch, harness and shift switch.
4. Verify the ground connection for that CDM Module.
5. Replace the CDM on the cylinder dropping spark.

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### MISS AT ANY RPM:

1. Disconnect the Yellow wires from the stator to the rectifiers and retest. If the miss clears, replace the rectifier.
2. 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 trigger or CDM module. Check the trigger DVA voltage (see NO SPARK OR INTERMITTENT SPARK ON ONE OR MORE CYLINDERS above).
3. 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.
4. Check the triggering and charge coil flywheel magnets for cracked, broken and loose magnets.
5. Index the flywheel and check the timing on ALL cylinders. On carbureted models, the control module rev limit function starts to retard timing in sequence (2, 3, 4, 5, 6, 1) at 5800-6000 RPM. The control module will retard the timing on each cylinder up to 30 degrees (starting with #2) and then stop firing that cylinder if the RPM is still above the limit. It will continue to retard and shut down cylinders until the engine drops below the limit.

### NO SPARK OR INTERMITTENT SPARK ON #1, #2 and #3 OR #4, #5 and #6 CYLINDERS:

1. Check the cranking RPM. A cranking speed less than 250-RPM may not allow the system to spark properly.
2. Disconnect the CDM modules one at a time and see if you get spark back on the problem cylinders.
3. Check the stator resistance and DVA output as given below:

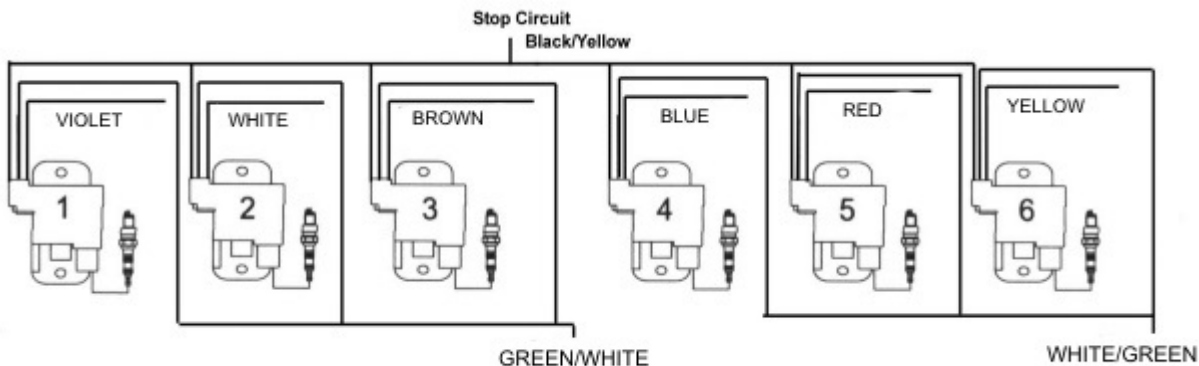
WIRE	READ TO	OEM OHMS	CDI OHMS	DVA (Connected)	DVA (Disconnected)
White/Green	Green/White	380-430	380-430	160-400 V	200-400 V (*)
White/Green	Engine GND	Open	Open	160-400 V	< 2 V
Green/White	Engine GND	Open	Open	160-400 V	< 2 V

(\*) This reading can be used to determine if a stator or the CDM modules have a problem. For instance, if you have no spark on any cylinder and the stator's DVA reading is low – disconnect the stator wires and recheck the DVA output. If the reading stays low – the stator is bad. If the reading is now within spec – at least one of the CDM modules is bad.

4. Check the trigger resistance and DVA output (see NO SPARK OR INTERMITTENT SPARK ON ONE OR MORE CYLINDERS above).
5. Check the trigger DVA output as given below:

WIRE	READ TO	RESISTANCE	DVA (Connected)
Purple Engine	GND	Open	0.2V to 2V
White Engine	GND	Open	0.2V to 2V
Brown Engine	GND	Open	0.2V to 2V
Blue Engine	GND	Open	0.2V to 2V
Red Engine	GND	Open	0.2V to 2V
Yellow Engine	GND	Open	0.2V to 2V

6. If (#1, #2 and #3) or (#4, #5 and #6) 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.
7. 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 or #6 not to have spark.





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## ENGINE HAS ERRATIC TIMING OR ADVANCED TIMING:

1. Check the trigger magnet in the flywheel to see if it is loose or cracked.
2. Disconnect the 4 wire Detonation Controller and check the DVA voltage on the Black/White wire, reference to engine ground. You should read between 25 and 40 volts. If the voltage is low, replace the TPM Control Module.
3. Replace the TPM Controller.

## ENGINE HARD TO SHIFT INTO OR OUT OF GEAR:

Check the Bias DVA voltage on the Black/White wire, reference to engine ground. You should read between 25 and 40 volts. If the voltage is low, replace the TPM Control Module.

## ENGINE MIS-FIRES OVER 2000 RPM:

1. Connect a CDM Test Harness (CDI P/N: 511-5207A 1) to the CDM modules and check the DVA voltage from the stator and trigger.
  - A) You should have between 160 and 320 volts on the Green/White or White/Green stator lead. If the voltage is low, check the stator resistance. If it is high, check the CDM and ground connections.
  - B) The trigger should read between 2 and 8 volts. If the voltage is low, check the trigger resistance. If it is high, check the CDM and ground connections.

NOTE: If the stator read low on three cylinder and they share the same color code, swap the stator wires and retest. If the problem moves, replace the stator. If the problem stays on the same CDMs, one of them is defective.
2. Check the DVA voltage on the Black/White wire, reference to engine ground. You should read between 25 and 40 volts. If the voltage is low, replace the TPM Control Module.

## ENGINE DOUBLE FIRING:

1. Check the two ground connections for the CDM Modules (each will have 3 Black wires in a single ring terminal located on the CDM Module mounting plate. Firmly pull on the Black ground wires against the ring terminal. If the wire comes out or the terminal seems loose inside the sleeve, replace the single terminal with individual ring terminals. Remove the old ring terminal and clean the mounting area for the ring terminals. Bolt the new ring terminals in place using the original mounting bolt. When the repair is complete, cover the exposed ring terminals with a protective coating like liquid electrical tape or neoprene.
2. Check the Bias DVA voltage on the Black/White wire, reference to engine ground. You should read between 25 and 40 volts. If the voltage is low, replace the TPM Control Module.
3. Swap the CDM that is double-firing with another CDM firing cleanly. If the problem moves, replace the defective CDM.

## FUEL INJECTORS NOT ACTIVATING (EFI MODELS ONLY):

1. Check the DVA voltage on the Green, Green/White and Green/Red wires, reference to engine ground at cranking speed. You should read at least 8 volts. If the voltage is low, check the voltage on the Purple wire going to the Controller, you should read above 10 volts while cranking the engine.
2. Check the voltage going to the fuel injectors, you should read above 10 volts while cranking the engine.
3. Check the DVA voltage across the fuel injectors, if you see approximately 25-60 volts, the injectors are pulsing. You may have stopped up injectors.