



# Installation and Troubleshooting Guide

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**CDI P/N: 116-3301**

**NOTE: This unit will replace the following P/N's: 653301-1 (300-F817974A1).**

Warning! This product is designed for installation 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.

## Troubleshooting

### GENERAL:

1. Disconnect the stop wires from the CD and connect a DC voltmeter between the stop wires and engine ground, turn the ignition switch on and off several times. If, at any time, you see voltage appearing on the meter, there is a problem in the harness or ignition switch. **AT NO TIME SHOULD YOU SEE BATTERY VOLTAGE ON A STOP CIRCUIT.**
2. Check the flywheel for a broken or loose magnet.
3. Check for broken wires and terminals, especially inside the plastic plug-in connectors. We recommend that you remove the pins from the connectors using the CDI **511-9706** pin removal tool and visually inspect them.
4. Visually inspect the stator for burned or discolored areas. If found, replace the stator. If the areas are on the battery charge windings, it indicates a possible problem with the rectifier.

### Two Cylinder Engines

#### IF THERE IS NO SPARK ON EITHER CYLINDER:

1. Disconnect all stop wires AT THE PACK.
2. Check for broken or bare wires on the switch box, stator and trigger.
3. Measure DVA voltage of the stator between the output wire sets.

Meter Red Lead	Meter Black Lead	Ohms Reading	DVA Reading
Blue (Brown/Blue)	Yellow (Brown/Yellow)	680-850 (OEM) 250-350 (CDI)	180V + Connected
Blue (Brown/Blue)	Engine Ground	Open	180V + Connected ( $\leq$ 2V disconnected)
Yellow (Brown/Yellow)	Engine Ground	Open	180V + Connected ( $\leq$ 2V disconnected)
4. Disconnect the rectifier. If the engine now has spark, replace the rectifier.

#### IF THERE IS NO SPARK OR INTERMITTENT SPARK ON ONE CYLINDER:

1. Check the stator resistance;
2. Measure the DVA voltage and resistance of the stator and trigger:

Meter Red Lead	Meter Black Lead	Ohms Reading	DVA Reading
Blue (Brown/Blue)	Yellow (Brown/Yellow)	680-850 (OEM) 250-350 (CDI)	180V +
Blue (Brown/Blue)	Engine Ground	Open	180V + Connected ( $\leq$ 2V disconnected)
Yellow (Brown/Yellow)	Engine Ground	Open	180V + Connected ( $\leq$ 2V disconnected)
Orange (White/Orange)	Green (White/Yellow)	45-55	0.5V +
Red (White/Red)	White/Green	45-55	0.5V +
3. If readings are good, swap the power pack output from the ignition coil that works to the one that does not. If the coil that had spark stops sparking, replace the power pack.

#### ENGINE WILL NOT SHUT OFF:

Check the stop circuit in the pack by using a jumper wire connected to the white stop wire coming out of the pack and shorting it to ground. If this stops all spark from the pack, the stop circuit in the harness or on the boat is bad. The ignition switch could also be bad.

#### NO SPARK UNLESS THE SPARK PLUGS ARE OUT:

Check for dragging starter or low battery causing slow cranking speed. DVA test stator and trigger.

#### HIGH SPEED MISS:

1. Using the CDI meter with the 511-9773 peak reading adapter, (or CD-77) and 511-9770 piercing probes, DVA check stator voltage to each pack at high speed. If it exceeds 400 volts, replace the pack.
2. Disconnect the rectifier. If the engine now has spark, replace the rectifier.
3. Check for broken wires and terminals, especially inside the plastic plug-in connectors. We recommend that you remove the pins from the connectors using the CDI **511-9706** pin removal tool and visually inspect them.
4. Check the flywheel for a broken or loose magnet.
5. Disconnect the stop wires from the CD and connect a DC voltmeter between the stop wires and engine ground, turn the ignition switch on and off several times. If, at any time, you see voltage appearing on the meter, there is a problem in the harness or ignition switch. **AT NO TIME SHOULD YOU SEE BATTERY VOLTAGE ON A STOP CIRCUIT.**
6. Visually inspect the stator for burned or discolored areas. If found, replace the stator. If the areas are on the battery charge windings, it indicates a possible problem with the rectifier.



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## Connections

### Pack #1 (Firing #1 and #2 Cylinders)

<b>Pack:</b>	White/Orange Stripe	<b>Trigger:</b>	White/Orange Stripe
	White/Yellow		White/Yellow (a)
	White/Red		White/Red (a)
	White/Green Stripe		White/Green Stripe
<b>Pack:</b>	Brown/Yellow Stripe	<b>Stator:</b>	Brown/Yellow Stripe
	Brown/Blue Stripe		Brown/Blue Stripe
<b>Pack:</b>	Orange/Blue	<b>Coil:</b>	White
	Blue/Red		White

## Color Code Cross Reference

FUNCTION	OLD	NEW
Trigger	Orange	White/Orange Stripe
Trigger	Green	White/Yellow Stripe
Trigger	Red	White/Red Stripe
Trigger	White/Green Stripe	White/Green Stripe
Stator	Blue	Brown/Blue Stripe
Stator	Yellow	Brown/Yellow Stripe
Ignition Coil	White	Orange/Blue
Stop Circuit	White	Black/Yellow

## Three and Four Cylinder Engines

### NO SPARK ON ANY CYLINDER:

1. Disconnect the stop wire AT THE PACK.
2. Check for broken or bare wires on the unit, stator and trigger.
3. Measure the DVA voltage and resistance of the stator and trigger:

Meter Red Lead	Meter Black Lead	Ohms Reading	DVA Reading
Blue (Brown/Blue)	Yellow (Brown/Yellow)	680-850 (OEM) 250-350 (CDI)	180V +
Blue (Brown/Blue)	Engine Ground	Open	180V + Connected ( $\leq 2V$ disconnected)
Yellow (Brown/Yellow)	Engine Ground	Open	180V + Connected ( $\leq 2V$ disconnected)
Orange (White/Orange)	Green (White/Yellow)	45-55	0.5V +
Red (White/Red)	White/Green	45-55	0.5V +

4. Disconnect the rectifier. If the engine now has spark, replace the rectifier.

### NO SPARK OR INTERMITTENT SPARK ON ONE CYLINDER:

1. Measure the DVA voltage and resistance of the stator and trigger:

Meter Red Lead	Meter Black Lead	Ohms Reading	DVA Reading
Blue (Brown/Blue)	Yellow (Brown/Yellow)	680-850 (OEM) 250-350 (CDI)	180V +
Blue (Brown/Blue)	Engine Ground	Open	180V + Connected ( $\leq 2V$ disconnected)
Yellow (Brown/Yellow)	Engine Ground	Open	180V + Connected ( $\leq 2V$ disconnected)
Orange (White/Orange)	Green (White/Yellow)	45-55	0.5V +
Red (White/Red)	White/Green	45-55	0.5V +

2. If readings are good, disconnect stop wire from one pack. If the dead cylinder starts sparking, the problem is likely the blocking diode in the opposite pack.
3. If #2 on a three cylinder engine is the one not firing and the engine has a CDI stator installed, disconnect the Blue wire going to the #2 pack and see if the #2 cylinder starts firing. If so, reconnect the Blue wire with the Blue wire going to the #1 pack.

### NO FIRE ON TWO CYLINDERS:

1. If two cylinders from the same CD unit will not fire, Measure the DVA voltage and resistance of the stator and trigger:

Meter Red Lead	Meter Black Lead	Ohms Reading	DVA Reading
Blue (Brown/Blue)	Yellow (Brown/Yellow)	680-850 (OEM) 250-350 (CDI)	180V +
Blue (Brown/Blue)	Engine Ground	Open	180V + Connected ( $\leq 2V$ disconnected)
Yellow (Brown/Yellow)	Engine Ground	Open	180V + Connected ( $\leq 2V$ disconnected)
Orange (White/Orange)	Green (White/Yellow)	45-55	0.5V +
Red (White/Red)	White/Green	45-55	0.5V +

2. If the engine has a CDI stator installed:
  - a. If #1 and #3 are the ones not firing, disconnect the Yellow stator wire from the # 1 pack and see if the #3 cylinder starts firing. Is so, replace the #1 pack. If not, then reconnect the Yellow stator wire to the # 1 pack and disconnect the Yellow stator wire from the # 2 pack and see if the #1 cylinder starts firing. If so, replace the # 2 pack.
  - b. If #2 and #4 are the ones not firing, disconnect the Blue stator wire from the # 1 pack and see if the #4 cylinder starts firing. Is so, replace the #1 pack. If not, then reconnect the Blue stator wire to the # 1 pack and disconnect the Blue stator wire from the # 2 pack and see if the #2 cylinder starts firing. If so, replace the # 2 pack.

### ENGINE WILL NOT SHUT OFF:

Check the stop circuit in the pack by using a jumper wire connected to the stop wire coming out of the pack and shorting it to ground. If this stops the pack from firing, the stop circuit in the harness or on the boat is bad. The ignition switch could also be bad.

### COILS ONLY SPARK WITH THE SPARK PLUGS OUT:

Check for dragging starter or low battery causing slow cranking speed. DVA test stator and trigger.

### HIGH SPEED MISS:

1. Using the CDI meter with the 511-9773 peak reading adapter, (or CD-77) and 511-9770 piercing probes, DVA check stator voltage to each pack at high speed. If it exceeds 400 volts, replace the pack.



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2. Disconnect the rectifier. If the engine now has spark, replace the rectifier.

## Pack #1 (Firing #1 and #2 Cylinders)

<b>Pack:</b> White/Orange Stripe	<b>Trigger:</b> White/Orange Stripe
White/Yellow	White/Yellow (a)
White/Red	White/Red (a)
White/Green Stripe	White/Green Stripe
<b>Pack:</b> Brown/Yellow Stripe	<b>Stator:</b> Brown/Yellow Stripe
Brown/Blue Stripe	Brown/Blue Stripe
<b>Pack:</b> Orange/Blue	<b>Coil:</b> White
Blue/Red	White

## Pack #2 (Firing #3 and #4 Cylinders)

<b>Pack:</b> White/Orange Stripe	<b>Trigger:</b> White/Orange Stripe
White/Yellow	White/Yellow (a)
White/Red	White/Red (a)
White/Green Stripe	White/Green Stripe
<b>Pack:</b> Brown/Yellow Stripe	<b>Stator:</b> Brown/Yellow Stripe
Brown/Blue Stripe	Brown/Blue Stripe
<b>Pack:</b> Orange/Blue	<b>Coil:</b> White
Blue/Red	White

## Pack #2 (Firing #3 Cylinder)

<b>Pack:</b> White/Orange Stripe	<b>Trigger:</b> White/Orange Stripe
White/Yellow	White/Yellow (a)
White/Red	No Connection
White/Green Stripe	No Connection
<b>Pack:</b> Brown/Yellow Stripe	<b>Stator:</b> Brown/Yellow Stripe
Brown/Blue	No Connection (must be connected to the blue terminal on pack 1)
<b>Pack:</b> Orange/Blue	<b>Coil:</b> White
Blue/Red	No Connection

(a) CDI replacement triggers do not have a connection for this wire from the power pack as the new trigger uses a common ground wire. This allows the wires going to the power pack from the trigger to be larger and more durable. The power pack uses that color as a ground wire for the trigger.

## Color Code Cross Reference

FUNCTION	OLD	NEW
Trigger	Orange	White/Orange Stripe
Trigger	Green	White/Yellow Stripe
Trigger	Red	White/Red Stripe White/Green Stripe
Trigger	White/Green Stripe	White/Green Stripe
Stator	Blue	Brown/Blue Stripe
Stator	Yellow	Brown/Yellow Stripe
Pack Output to Coil	Orange	Orange/Blue
Pack Output to Coil	Red	Blue/Red
Ignition Coil	White	Orange/Blue
Stop (Kill) Circuit	White	Black/Yellow

## Sample Connection for a 4 Cylinder Using New Design CDI Trigger

<b>Pack #1 (Firing #1 and #2 cylinders)</b>	<b>Pack #2 (Firing #3 and #4 cylinders)</b>
<b>Pack:</b> White/Orange Stripe	<b>Pack:</b> White/Orange Stripe
White/Yellow	White/Yellow Stripe
White/Red	White/Red
White/Green Stripe	White/Green Stripe
<b>Pack:</b> Yellow	<b>Pack:</b> Yellow
Blue	Blue
<b>Pack:</b> Orange/Blue	<b>Pack:</b> Orange/Blue
Blue/Red	Blue/Red
<b>Trigger:</b> White/Orange Stripe	<b>Trigger:</b> White/Orange Stripe
No Connection	No Connection
No Connection	No Connection
White/Green Stripe	White/Green Stripe
<b>Stator:</b> Yellow	<b>Stator:</b> Yellow
Blue	Blue
<b>Coil #1:</b> White	<b>Coil #3:</b> White
<b>Coil #2:</b> White	<b>Coil #4:</b> White

Thank you for using CDI Electronics.

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