



# 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: 116-3301 Ignition Pack 3 & 4 Cylinder

**NOTE: This unit will replace the following P/N's: F653301, F653301-1, FK653301, and (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.

### INSTALLATION

1. Disconnect the negative battery cable.
2. Loosen the mounting plate for the ignition coils and power packs.
3. Disconnect the old power pack wires and remove it from the mounting plate, saving the mounting bolts.
4. Clean and inspect the ignition coil, power pack and mounting plate ground pints and wires.
5. Install the new power pack on the mounting plate using the bolts removed previously. Make sure the ground wire is on a clean ground point.
6. Connect the new power pack as the old one was connected. Use the connection guides below as a template. NOTE: Due to the changes in the wire colors by the original manufacturer, the following chart is used as a guide.

### 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
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

### CONNECTION GUIDE

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

**Pack:** White/Orange Stripe  
White/Yellow  
White/Red  
White/Green Stripe

**Trigger:** White/Orange Stripe  
White/Yellow (a)  
White/Red(a)  
White/Green Stripe

**Pack:** Brown/Yellow Stripe  
Brown/Blue Stripe

**Stator:** Brown/Yellow Stripe  
Brown/Blue Stripe

**Pack:** Orange/Blue  
Blue/Red

**Coil:** White  
White

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

**Pack:** White/Orange Stripe  
White/Yellow  
White/Red  
White/Green Stripe

**Trigger:** White/Orange Stripe  
White/Yellow (a)  
White/Red (a)  
White/Green Stripe

**Pack:** Brown/Yellow Stripe  
Brown/Blue Stripe

**Stator:** Brown/Yellow Stripe  
Brown/Blue Stripe

**Pack:** Orange/Blue  
Blue/Red

**Coil:** White  
White

#### Pack #2 (Firing #3 Cylinder ON A 3 CYLINDER APPLICATION ONLY)

**Pack:** White/Orange Stripe  
White/Yellow  
White/Red  
White/Green Stripe

**Trigger:** White/Orange Stripe  
White/Yellow (a)  
No Connection  
No Connection

**Pack:** Brown/Yellow Stripe  
Brown/Blue

**Stator:** Brown/Yellow Stripe  
No Connection (must be connected to the blue terminal on pack 1)

**Pack:** Orange/Blue  
Blue/Red

**Coil:** White  
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.

### 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.

CDI Electronics, LLC • 353 James Record Road SW • Huntsville, AL 35824 USA

Web Support: [www.cdielelectronics.com](http://www.cdielelectronics.com) • Tech Support: 1-866-423-4832 • Order Parts: 1-800-467-3371

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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 the White or Black/Yellow kill wire AT THE PACK. If spark returns, there is a problem in the kill circuit. Possibly the ignition switch, harness or a pinched wire.
2. Check the flywheel for a loose, damaged or broken ring magnet.
3. Check for broken or bare wires on the switch box, stator and trigger.
4. 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)

5. 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) 250-450 (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 high speed miss is gone, 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, damaged 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.

## Three and Four Cylinder Engines

### NO SPARK ON ANY CYLINDER:

1. Disconnect and separate the White or Black/Yellow kill wires AT THE PACKS. If spark returns, there is a problem in the kill circuit, possibly the ignition switch, harness or a pinched wire. Connect the two White or Black/Yellow kill wires together and see if you lose spark again. If so, replace the ignition packs.
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.

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## 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 packs by using a jumper wire connected to the stop wire coming out of each 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. If no change, replace the pack.

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

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

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