Installation and Troubleshooting Guide

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: 176-5095

This Stator replaces the following P/N's: 300-475095, 300-888792, 300-F475095, 300-F616095, 475095, 615095, 616095, 888792, F475095, F615095, F616095, and FA615095.

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.

This Stator requires the modification of the Switchbox wire connections. The round black plug connector will need to be removed and bullet connectors will need to be installed on the Switchbox wires.

INSTALLATION

2 CYLINDER ENGINE

1. Disconnect the negative battery cable.
2. Remove the Flywheel.
3. Disconnect the Green/Yellow Battery Charge leads from the terminal strip.
4. Disconnect the Stator's Brown/Yellow and Brown/Blue wires.
5. Remove the old Stator, saving the mounting bolts.
6. Mount the new Stator using the original mounting bolts. Follow OEM guidelines regarding use of a Thread Locker.
7. Place a wire tie around the wires coming from the Switchbox approximately 3-4 inches from the 2-pin connector.
8. Remove both 2 pin connector by cutting the wires (Yellow & Blue or Brown/Yellow & Brown/Blue) close to the connector on the Switchbox.
9. Slide the clear boots onto the Brown/Yellow & Brown/Blue wires coming from the Switchbox.
10. Remove approximately 3/16" of insulation from each of the Brown/Yellow & Brown/Blue wires from the Switchboxes.
11. Crimp the new male bullet terminals provided onto the Brown/Yellow & Brown/Blue wires (Solder them on if possible) from the Switchboxes. Save any unused terminals for future needs.
12. Connect the Brown/Yellow & Brown/Blue wires from the Switchbox to the Brown/Yellow & Brown/Blue wires from the new Stator. The extra Stator wires are not used, wire tie it out of the way.
13. Reconnect the negative battery cable.

3 CYLINDER ENGINE

1. Disconnect the negative battery cable.
2. Remove the Flywheel.
3. Disconnect the Green/Yellow Battery Charge leads from the terminal strip.
4. Disconnect the Stator Brown/Yellow and Brown/Blue wires.
5. Remove the old Stator, saving the mounting bolts.
6. Mount the new Stator using the original mounting bolts. Follow OEM guidelines regarding use of a Thread Locker.
7. Place a wire tie around the wires coming from the Switchboxes approximately 3-4 inches from the 2-pin connector.
8. Remove both 2 pin connectors by cutting the Brown/Yellow & Brown/Blue wires close to the connectors on the Switchboxes.
9. Slide the clear boots onto the wires Brown/Yellow & Brown/Blue coming from the Ignition Pack.
10. Remove approximately 3/16" of insulation from each of the Brown/Yellow & Brown/Blue wires from the Switchboxes.
11. Crimp the new male bullet terminals provided onto the Brown/Yellow & Brown/Blue wires (Solder them on if possible) from the Switchboxes.
12. Connect the Yellow & Blue or Brown/Yellow & Brown/Blue wires from the Switchbox to the Brown/Yellow & Brown/Blue wires from the new Stator.
13. Reconnect the negative battery cable.

4 CYLINDER ENGINE

1. Disconnect the negative battery cable.
2. Remove the Flywheel.
3. Disconnect the Green/Yellow Battery Charge leads from the terminal strip.
4. Disconnect the Stator Ignition leads. Then, remove the old Stator, saving the mounting bolts.
5. Mount the new Stator using the original mounting bolts. Follow OEM guidelines regarding use of a Thread Locker.

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6. Place a wire tie around the wires coming from the Ignition Pack approximately 3-4 inches from the 2-pin connector.
7. Remove both 2 pin connectors by cutting the Brown/Yellow & Brown/Blue wires close to the connectors on the Switchboxes.
8. Slide the clear boots onto the Brown/Yellow & Brown/Blue wires coming from the Switchbox.
9. Remove approximately 3/16" of insulation from each of the Brown/Yellow & Brown/Blue wires from the Switchboxes.
10. Crimp the new male bullet terminals provided onto the Brown/Yellow & Brown/Blue wires (Solder them on if possible) from the Switchboxes.
11. Connect the Yellow & Blue or Brown/Yellow & Brown/Blue wires from the Switchbox to the Brown/Yellow & Brown/Blue wires from the new Stator.
12. Reconnect the negative battery cable.

TROUBLESHOOTING

NO SPARK ON ANY CYLINDER:

1. Disconnect and separate the White kill wire(s) AT THE SWITCHBOX. If spark comes back, touch the White kill wires together and check for spark. If no spark, replace the Switchbox(es). If you still have spark with the White wires touching together, there is a problem in the harness or key switch.
2. Disconnect the Rectifier. If the engine sparks, replace the Rectifier.
3. Check for broken or bare wires on the Switchbox, Stator, and Trigger.
4. Check the Stator and Trigger resistance and DVA for 2 cylinder engines as follows:

Read from	Read to	OEM Ohms	CDI Ohms	DVA (Connected)	DVA (Disconnected)
Brown/Blue (Stator)	Brown/Yellow (Stator)	680-900 Ω	250-350 Ω	180-400 V	-
Brown/Blue (Stator)	Engine Gnd	Open	Open	-	Less than 2 V
Brown/Yellow (Stator)	Engine Gnd	Open	Open	-	Less than 2 V
White/Orange (#1 Trigger)	White/Yellow (#1 Trigger)	45-55 Ω	45-55 Ω	0.5 V Minimum	-
White/Red (#2 Trigger)	White/Green (#2 Trigger)	45-55 Ω	45-55 Ω	0.5 V Minimum	-

NOTE: Some OEM Stators had Blue and Yellow wires instead of the Brown/Blue and Brown/yellow wires.

NOTE: Some OEM Triggers had Orange and Green, or Red and White/Green Wires.

5. Check the Stator and Trigger resistance and DVA for 3 and 4 cylinder engines as follows:

Read from	Read to	OEM Ohms	CDI Ohms	DVA (Connected)	DVA (Disconnected)
Brown/Blue (Stator)	Brown/Yellow (Stator)	680-900 Ω	250-450 Ω	180-400 V	-
Brown/Blue (Stator)	Engine Gnd	Open	Open	-	Less than 2 V
Brown/Yellow (Stator)	Engine Gnd	Open	Open	-	Less than 2 V
Green (#1 Trigger)	Orange (#1 Trigger)	45-55 Ω	45-55 Ω	0.5 V Minimum	-
Red (#2 Trigger)	White/Green (#2 Trigger)	45-55 Ω	45-55 Ω	0.5 V Minimum	-
Green (#3 Trigger)	Orange (#3 Trigger)	45-55 Ω	45-55 Ω	0.5 V Minimum	-
Red (#4 Trigger)	White/Green (#4 Trigger)	45-55 Ω	45-55 Ω	0.5 V Minimum	-

NOTE: If the voltage is correct between the wires, but exceeds 10% different to engine ground, swap the Yellow wire leads with the Blue wires to see if the problem moves. If it does, replace the Stator.

NO SPARK OR INTERMITTENT SPARK ON ONE CYLINDER:

1. Check the Stator and Trigger resistance and DVA (see **NO SPARK ON ANY CYLINDER**).
2. If readings are good, swap the Switchbox Primary wire from the Ignition coil that works to the one that does not. If the Ignition coil that had spark stops firing, replace the Switchbox.

NO SPARK ON INTERMITTENT SPARK TWO CYLINDERS:

1. If two cylinders from the same Switchbox will not fire, the problem is usually in the Stator. Check the Stator DVA (see **NO SPARK ON ANY CYLINDER**).
2. If the #1 and #3 cylinders are not firing, disconnect the Brown/Yellow wire from the Switchbox #1 and retest. If you now get fire on #3, replace the #1 Switchbox. Reconnect the Brown/Yellow wire to Switchbox #1.
3. If still no fire on #3, disconnect the Brown/Yellow wire from the Switchbox #2 and retest. If you now get fire on #1, replace the #2 Switchbox.
4. If the #2 and #4 cylinders are not firing, disconnect the Brown/Blue wire from the Switchbox #1 and retest. If you now get fire on #4, replace the #1 Switchbox. Reconnect the Brown/Blue wire.

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5. If still no fire on #4, disconnect the Brown/Blue wire from the Switchbox #2 and retest. If you now get fire on #2, replace the #2 Switchbox.

ONLY HAS SPARK WITH SPARK PLUGS OUT:

1. Check the cranking RPM. A cranking speed less than 250 RPM will not allow the system to fire properly. This can be caused by a weak battery, dragging starter, bad battery cables, or a mechanical problem inside the engine.
2. Check the Stator and Trigger resistance and DVA (see **NO SPARK ON ANY CLYINDER**).

MISS AT ANY RPM:

1. Disconnect the Rectifier from the Stator and retest. If the miss clears up, replace the Rectifier.
2. In the water or on a Dynamometer, check the DVA from the Switchbox primary wires while connected to the Ignition coils. You should have a reading of at least 150 V or more, increasing with engine RPM until it reaches 300-400 V 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 Switchbox or Trigger.
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 Switchbox or Ignition coil. Occasionally a Trigger will cause this same problem. Check the Trigger DVA (see **NO SPARK ON ANY CYLINDER**).
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.

SWITCHBOX OR TRIGGER REPEATEDLY BLOWS ON SAME CYLINDER:

1. Disconnect and separate the kill wires. If spark returns to the dead cylinder, replace the Switchbox that was firing correctly as it likely has a problem in the blocking diode.
2. Check the Trigger wires for shorts to engine ground because a shorted Trigger wire can destroy a SCR inside the Switchbox.
3. In contrast, a shorted SCR inside the Switchbox can destroy a Trigger coil. Check the Trigger resistance and DVA (see **NO SPARK ON ANY CYLINDER**).
4. Replace the Ignition coil on the cylinder dropping spark.

ENGINE WILL NOT STOP (KILL):

1. Disconnect all stop wires at the Switchbox. Connect a jumper wire to the (White or Black/Yellow) stop wire from the Switchbox and short it to engine ground. If this stops the Switchbox from firing, the stop circuit has a fault. Check the key switch, harness, and shift switch (if present). If this does not stop the Switchbox from firing, replace the Switchbox. Repeat test as necessary for additional Switchboxes.

BATTERY CHARGING ISSUES:

1. Regardless if the charging issue is overcharging or not charging at all, the #1 cause of all charging issues is the battery often due to improper style and/or charging neglect. #2 is the battery's connections. #3 is the Rectifier. #4 is the Stator.
2. The recommended type of battery for outboards is a single (NOT more than one) 850+ CCA dual purpose or cranking/starting **non-maintenance-free battery**.
3. Non-maintenance-free batteries (lead-acid flooded cell; has vent caps on its top) have heavy, thick plates. They're ideal for outboards, where batteries are commonly drained by accessories while fishing, etc. when there is no charge applied to a battery while the battery is in use. Its heavy plates can withstand constant discharging and charging. These batteries have much more reserve time and are much more suited for this behavior.

   NOTE: Some Maintenance free batteries will have vented caps on top. When in doubt, change the battery to a non-maintenance free type.

4. Maintenance-free batteries should ***NEVER*** be used in an Outboard application. A new, fully charged maintenance-free battery may work fine at first but their life span is dramatically shortened due to the constant charging and discharging. This activity will cause the cells to become weak, and/or the cells will become dead. When this happens, the battery is unable to accept a full charge, thus putting the Rectifier at extreme risk of failure. Therefore, maintenance-free style batteries commonly cause charging issues shortly after installation.
5. Check all battery connections, particularly at engine ground. Make sure that all connections are tight and free of corrosion. Do ***NOT*** use wing nuts as they tend to loosen over a period of time from vibration. A loose connection ***WILL*** cause a premature battery and/or Rectifier failure(s).
6. If there is no change, try a single (***NOT*** more than one) known good fully charged battery that is 850+ CAA Dual Purpose, or a cranking/starting battery that is non-maintenance free. Make sure the battery is a lead acid flooded cell battery (has vent caps on its top).

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7. Measure the DVA across the Stator's Green/Yellow battery charge wires, while connected to the Rectifier. At idle the DVA will normally between 8-25 DVA. If not, disconnect the Green/Yellow wires from the Rectifier and retest. DVA will normally be 17-50 DVA at idle. If the voltage is low, the Stator is possibly faulty. Perform a visual of the Stator for browning and varnish dripping. These are signs that the Stator has overheated. If the visual inspection shows any of these signs, replace the Stator.

TACHOMETER TESTS

1. Measure the DVA across the Stator's Green/Yellow battery charge wires, while connected to the Rectifier. At idle the DVA will normally be between 8-25 DVA. If not, disconnect the Green/Yellow wires from the Rectifier and retest. DVA will normally be 17-50 DVA at idle. If the voltage is now within specification, the Rectifier is likely defective.
2. Disconnect the Rectifier's Gray wire. At 800-1,000 RPM, check the DVA on the Grey wire FROM THE RECTIFIER measured to engine ground. The reading should be 8 DVA or more. If not, replace the Regulator/Rectifier.
3. If at least 8 DVA, run a jumper wire from the Gray wire out of the harness to one of the Stator's Yellow wires.
4. If still no tachometer signal, try a known good tachometer.
5. If still no tachometer signal, replace the Stator.

CONNECTION GUIDE

Connections from #1 Switchbox (Firing #1 and #2 Cylinders) to Trigger, Stator, and Ignition coil:

Switchbox	Trigger	Stator	Ignition coil
White/Orange	White/Orange	-	-
White/Yellow	White/Yellow	-	-
White/Red	White/Red	-	-
White/Green	White/Green	-	-
Brown/Yellow	-	Brown/Yellow	-
Brown/Blue	-	Brown/Blue	-
Orange/Blue	-	-	White
Blue/Red	-	-	White

Connections from #2 Switchbox (Firing #3 Cylinder) to Trigger, Stator, and Ignition coil (3 Cylinder only):

Switchbox	Trigger	Stator	Ignition coil
White/ Orange	White/Orange	-	-
White/Yellow	White/Yellow*	-	-
White/Red	No Connection	-	-
White/Green	No Connection	-	-
Brown/Yellow	-	Brown/Yellow	-
Brown/Blue	No Connection (must be connected to the blue terminal on Switchbox #1)		
Orange/Blue	-	-	White
Blue/Red	-	-	No Connection

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Connections from #2 Switchbox (Firing #3 Cylinder and #4 cylinders) to Trigger, Stator, and Ignition coil (4 Cylinder only):

Switchbox	Trigger	Stator	Ignition coil
White/ Orange	White/Orange	-	-
White/Yellow	White/Yellow*	-	-
White/Red	White/Red*	-	-
White/Green	White/Green	-	-
Brown/Yellow	-	Brown/Yellow	-
Brown/Blue	-	Brown/Blue	-
Orange/Blue	-	-	White
Blue/Red	-	-	White

NOTE: * CDI replacement Triggers do not have a connection for this wire from the Switchbox as the new Trigger uses a common ground wire. This allows the wires going to the Switchbox from the Trigger to be larger and more durable. The Switchbox uses that color as a ground wire for the Trigger

Wire Color Code Reference:

Function	Old	New
Stator	Blue	Brown/Blue
Stator	Yellow	Brown/Yellow
Trigger	Orange	White/Orange
Trigger	Green	White/Yellow
Trigger	Red	White/Red
Trigger	White/Green	White/Green
Switchbox Primary	Orange	Orange/Blue
Switchbox Primary	Red	Blue/Red
Ignition Coil	White	Orange/Blue
Stop Circuit	White	Black/Yellow

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