Installation and Troubleshooting Guide

CDI P/N 123-9800

This unit can replace P/N's: 123-9898-P, 974730, 982749, 982755, 982774, 984036, 984276, 984281, 985902, 986342, 987738, 987739, and 987740.

WARNING! This product is designed to be installed 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.

The 123-9800 may not work and could damage the unit if the ballast resistor is removed or a high current aftermarket coil is used. The product warranty may be void. Contact CDI Technical support for help selecting correct parts for aftermarket ignition systems.

NOTE: This install sheet covers the 123-9898-P Electronic Shift Assist (ESA) module for boats equipped with a distributor using mechanical breaker points or an aftermarket electronic points replacement kit. If your boat has another type of distributor please call CDI for a cross reference to the correct part for your application.

INSTALLATION

1. With the engine OFF, disconnect and remove the old ESA module.
2. Using the original bolts, mount the new ESA to the mounting bracket, being careful not to pinch any wires.
3. Verify correct Ignition circuit resistance. (See Page 2)
   - A) Measure resistance of the coil (Step 1). Normal coil resistance should be 1.5Ω, if less resistance is found a higher resistance ballast resistor may be needed.
   - B) Reassemble all wiring, then, disconnect the 2 pin connector containing Violet and Gray wires. Measure the resistance between Violet and Gray wire on the engine side (Step 2). Measurement should be 3Ω.
   - C) If either reading in step A or B is not correct, Perform Engine stalls during shift troubleshooting and then select proper ballast resistor, or contact CDI Tech support for further help.
4. Connect the wires as the original ESA was connected.
5. The following is a color code/function explanation:

   Violet - Switched 12V power to the ESA module. This should **NOT** come from the positive side of the coil.
   Gray – Negative side of ignition coil for the ESA to monitor the engine RPM & override the distributor during shift.
   Black – Engine ground reference for the ESA module. The ESA must have a good ground connection.
   Blue – Ground signal from the shift switch indicating a shift is occurring. This activates the ESA.

TROUBLESHOOTING

Engine stalls during shift:

This usually only occurs with performance coils and modified ballast resistance. The higher the current in the ESA the more likely failure will occur. Typical ESA circuit current should not exceed 4-5 amps. With an aftermarket coil, ESA circuit current can exceed 10 amps. A typical stock set up uses a 1.5Ω coil and a 1.5Ω ballast resistor (3Ω total).

Perform measurements per installation guide step 3. If the total circuit resistance between the gray and violet wires is less than 3Ω, then calculate ballast resistance to be added. ***Example***: If measurement is 0.8Ω, then 3.0 Ω - *0.8* Ω = *2.2*Ω of ballast resistance needed. Rebalance the circuit by adding a ballast resistor per diagram on page 2.

Hard Shifting: ESA doesn't appear to affect RPM:

Verify all connections are correct. Inspect the connectors and make sure the wire colors and pin locations are the same on both sides of the connector. Check for pins that may have pushed out of the connector shell.

Back probe the Blue wire (*you may remove the wire from the connector if needed*) and with the engine idling in neutral, short the Blue wire (*the end going to the ESA module*) to engine ground. You should notice a slight drop in engine Rpm. If the engine works correctly with this test, but does not work when the Blue wire is connected to the shift switch, check the shift switch and wires to ensure it is providing the ESA with a ground when the switch is activated.

Note: If the engine is idling too fast, or too slow, the ESA will not engage. If the ESA does not work with the Blue wire shorted to engine ground, recheck the engine RPM, ground wire connection and 12V power to the ESA.

Engine misses, erratic spark:

With the engine OFF, disconnect everything from the negative side of the coil except the distributor. If the condition persists, the distributor or coil requires servicing. If the problem clears up, reconnect wires to the negative side of the coil one at a time to isolate the problem. A defective tachometer gauge can affect ignition performance.

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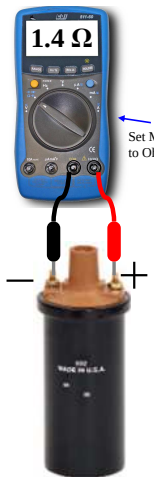
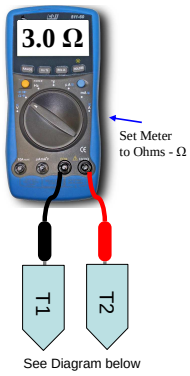
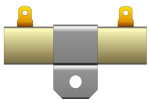


Step 1- Disconnect all wires from the coil and measure it's resistance.



See Diagram below

Step 2- Measure circuit resistance between Gray and Violet wire



Ballast Resistor Required

3 Ohms – Step 2 reading =

(See Table for Selection)

Step 3- Calculate how much ballast resistance to add.

Coil Ohms	Ballast Resistor Required	Ballast Resistor Selection	CDI Part #
0.4	2.6	2.5	121-BR50-2.5
0.5	2.5	2.5	121-BR50-2.5
0.6	2.4	2.5	121-BR50-2.5
0.7	2.3	2.5	121-BR50-2.5
0.8	2.2	2.5	121-BR50-2.5
0.9	2.1	2	121-BR50-2
1	2.0	2	121-BR50-2
1.1	1.9	2	121-BR50-2
1.2	1.8	2	121-BR50-2
1.3	1.7	2	121-BR50-2
1.4	1.6	1.5	121-BR50-1.5
1.5	1.5	1.5	121-BR50-1.5
1.6	1.4	1.5	121-BR50-1.5
1.7	1.3	1.5	121-BR50-1.5
1.8	1.2	1.5	121-BR50-1.5
1.9	1.1	1.5	121-BR50-1.5
2	1.0	1.5	121-BR50-1.5