



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 123-9898-P

This unit replaces P/N's: 123-9898-4, 123-9898-6, 123-9898-8, 982749, 982755, 982774, 984036, 984276, 984281, 984730, 984740, 985902, 986342, 986837, 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 123-9898-P may not work and could be damaged if the ballast resistor is removed or a high current aftermarket coil is used.

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 this ESA Module will not work.

INSTALLATION

1. Disconnect the negative battery cable.
2. Check and clean all wiring and connectors.
3. With the key switch in the off position, disconnect and remove the old ESA module.
4. Using the original bolts, mount the new ESA module to the mounting bracket, being careful not to pinch any wires.
5. Verify correct Ignition circuit resistance. (See Page 2)
 - a) Measure the resistance of the Ignition coil. Normal coil resistance should be 1.5 Ω , 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 harness. Measurement should be 3 Ω .
 - c) If either reading in step A or B is not correct, select proper ballast resistor (see **ENGINE STALLS WHEN SHIFTING**).

Note: You can use a 3.0 ohm coil and not need the Ballast Resistor if your total resistance on the engine side of the harness at the ESA module is equal to 3.0 Ω .

6. Connect the wires as the original ESA was connected.
7. Reconnect the Negative battery cable.
8. 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 Ignition coil.

Gray - Negative side of ignition coil for the ESA Module to monitor the engine RPM & override the distributor during shift.

Black - Engine ground reference for the ESA Module. The ESA Module must have a good ground connection.

Blue - Ground signal from the shift switch indicating a shift is occurring. This activates the ESA Module.

TROUBLESHOOTING

ENGINE STALLS WHEN SHIFTING:

1. This usually only occurs with high performance Ignition coils and a 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 1.5 Ω Ignition coil and a 1.5 Ω ballast resistor for 3 Ω total.
2. If the total circuit resistance between the Gray and Violet wires is Less than 3 Ω , then calculate the ballast resistance to be added.

Example: If measurement is 0.8 Ω , then 3.0 Ω - 0.8 Ω = 2.2 Ω of ballast resistance needed. Rebalance the circuit by adding a ballast resistor per the lower diagram.

HARD SHIFTING - ESA MODULE DOES NOT APPEAR TO AFFECT RPM:

1. 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.
2. Back probe the Blue wire (*you may have to 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 Module with a ground when the switch is activated.

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

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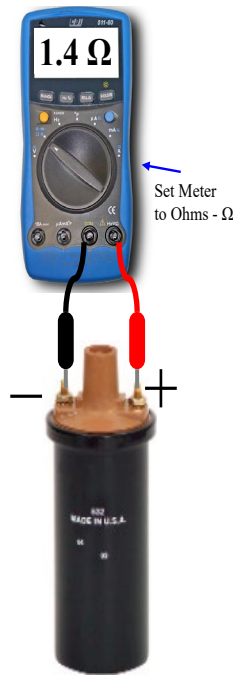
Web Support: www.cdielelectronics.com • Tech Support: 1-866-423-4832 • Order Parts: 1-800-467-3371

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ENGINE MIS-FIRES AND HAS ERRATIC SPARK

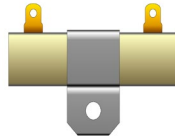
1. With the engine OFF, disconnect everything from the negative side of the coil except the distributor. If the condition persists, either the distributor or Ignition coil are defective. If the problem clears up, reconnect wires to the negative side of the coil one at a time to isolate the problem. A defective tachometer gauge can affect ignition performance as well as a defective ESA Module.
2. Check all wiring for corrosion or broken wires. Perform a continuity test as needed.



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



Step 2- Measure circuit resistance between Gray and Violet wire
See Diagram below



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

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