



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 123-9800 Electronic Shift Assist

High Amperage ESA . For Delco HEI Distributors (with coil in cap) 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 be damaged if the ballast resistor is removed and an excessively high current aftermarket coil is used. An Ignition Coil with a resistance lower than 1.0 ohms is not recommended. 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 123-9800 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. Normal coil resistance should be 1.1Ω to 3.0Ω. If less resistance is found, consider replacing the ignition coil with a higher resistance. If the reading is too high, check for a bad connection or broken wire.
 - B) Reassemble all wiring, then disconnect the 2 pin connector containing Violet and Grey wires. Measure the resistance between Violet and Gray wire on the engine side (Step 2). Measurement should be 1.1Ω to 3.0Ω.
 - C) If either reading in step A or B is not correct, 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 WHEN SHIFTING:

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 15 amps. With an aftermarket high output coil, ESA circuit current can exceed 25 amps. A typical stock set up uses a 1.1Ω to 3.0 Ω coil.

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 $3.0\ \Omega - 0.8\ \Omega = 2.2\ \Omega$ of ballast resistance needed. Rebalance the circuit by adding a ballast resistor per diagram on page 2.

HARD SHIFTING: ESA DOES NOT APPEAR TO CHANGE 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 remove the wire from the connector if needed*) and with the engine idling in neutral, short the Blue wire (*the end going into 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 MIS-FIRES AND HAS 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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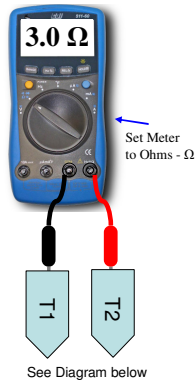
Web Support: www.cdielectronics.com • Tech Support: 1-866-423-4832 • Order Parts: 1-800-467-3371

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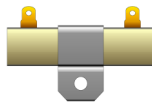
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Step 1- Disconnect all wires from the coil and measure it's resistance.



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

