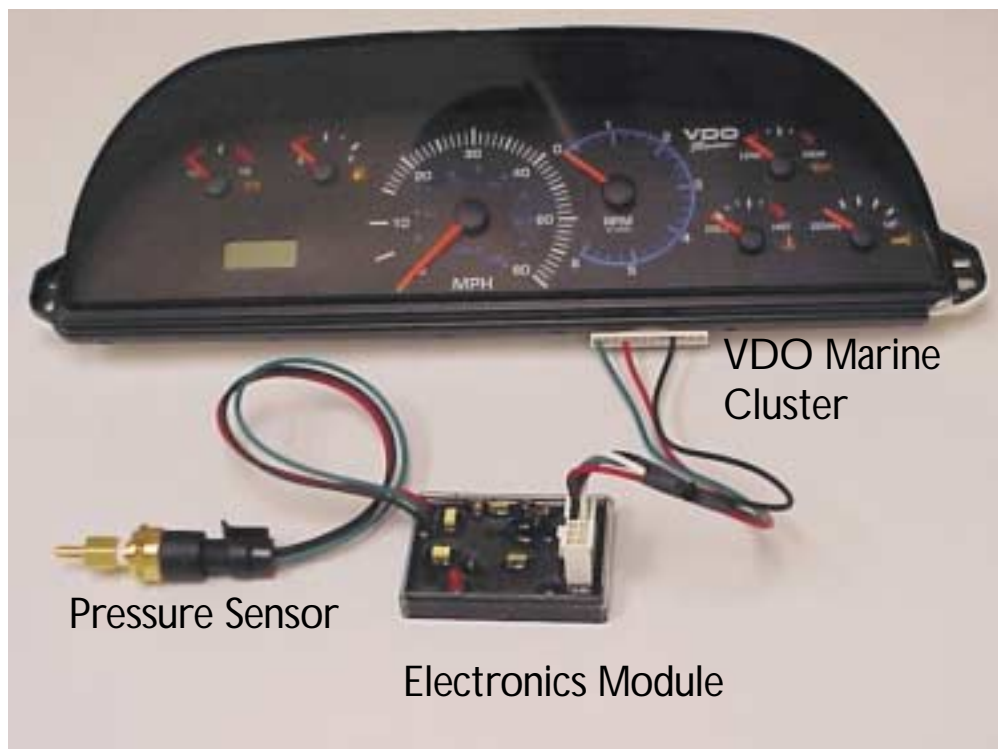


VDO Pitot Pressure to Speed Pulse System

Congratulations you have purchased one of the most advanced products in the marine industry today ! The VDO pitot pressure to speed pulse system incorporates the following features:

- o Robust solid state pressure sensor
- o Very accurate and reliable microprocessor based design
- o Generates speed pulses for boat speed below 5 miles per hour to over 80 miles per hour
- o Sensor fault detection
- o Automatic Zero speed (sensor) calibration
- o Automatic compensation for short interruptions of pitot pressure
- o Status indicator LED for system setup and diagnostics
- o Square wave speed pulse output to drive electronic speedometers

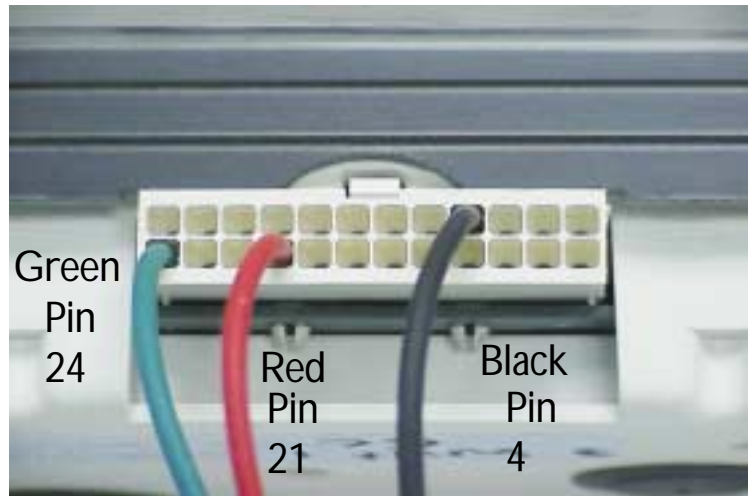
Only three connections are required to install the electronic module. These are Power Ground and Speed pulse output. The pictures and instructions on the next page will help you to install the unit. The electronic module outputs 10,800 pulses per statute mile at a frequency of 3 Hertz per mile per hour. This value is the default calibration for the VDO Boat Cluster. To use the module with other electronic speedometers set the speedometer calibration to 10,800 pulses per mile.



Power Input and Speed Pulse Output



Connections to VDO Boat Cluster

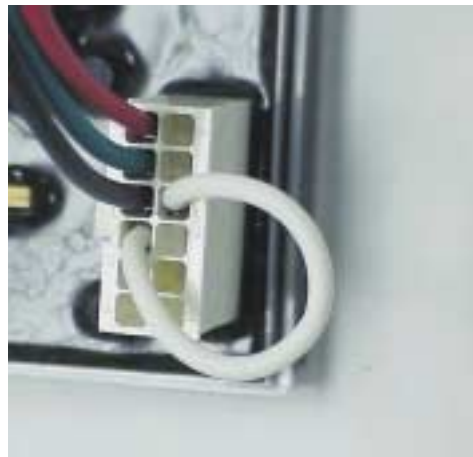


Sensor Calibration for Zero Speed

Picture "A"



Picture "B"



Picture "C"



Manual Calibration Procedure

Note: This procedure is only done once at install. If the indicated speed is correct at low speed (10 mph) there is no need to do this procedure.

1. The pressure sensor must be connected to Converter Module and Pitot Tube connected to sensor input port.
2. The boat should be in the water with the Pitot Tube submerged.
3. Remove the wire tie and sleeving from the white wire jumper exposing the contact pin as shown in picture A.
4. Insert the white wire contact pin into position 4 as shown in picture B. Make sure that the contact pin is fully inserted.
5. While watching the RED LED on the module Turn the ignition switch to the on (NOT starting) position.
6. The LED will blink 5 (once per second) times indicating good calibration. If not check the table on the next page.
7. If okay, turn the ignition switch off and disconnect the white wire jumper. Replace the sleeving over the contact pin and tie in place with a new wire tie (see picture C). Note: The free end of the white jumper is connected to ground so be sure to protect it against shorts to power or other wiring.

Calibration Jumper or Switch Input	Input Voltage From Sensor	LED Operation
Open	Less than 100mV	LED off until the input voltage from the sensor reaches a value greater than 400mV. (This assumes no sensor is connected)
Open	Input voltage in range (500mV \pm 85mV)	The LED will blink 10 times once per second. This is a good automatic Null indication.
Open	Input voltage out of range (input > 585mV or 415mV > input > 100mV).	At this condition the program will try to use the Null value previously stored in the non-volatile memory (EEPROM). If the value from the EEPROM is in range the LED will blink 20 times 2 times per second.
Open	Input voltage out of range (input > 585mV or 415mV > input > 100mV).	At this condition the program will try to use the Null value from the EEPROM. If the value from the EEPROM is NOT in range, the program will then use the default value of 500mV to indicate the zero speed. The LED will come ON and stay ON for 10 seconds.
Closed	Less than 100mV	LED off until the input voltage from the sensor reaches a value greater than 400mV. (this assumes no sensor is connected)
Closed	Input voltage in range (500mV \pm 85mV)	The LED will blink 5 times once per second. This is a good manual Null indication.
Closed	Input voltage out of range (input > 585mV or 415mV > input > 100mV).	For this condition the program will try to use the Null value previously stored in the non-volatile memory (EEPROM). If the value from the EEPROM is in range the LED will blink 10 times 2 times per second.
Closed	Input voltage out of range (input > 585mV or 415mV > input > 100mV).	For this condition the program will try to use the Null value from the EEPROM. If the value from the EEPROM is NOT in range, the program will then use the default value of 500mV to indicate the zero speed. The LED will come ON and stay ON for 5 seconds.