



Date Originated: 10/05/04	Revision: B	Revision Date: 07/15/08	Standards No. 5000041-01
Subject: VDO Programmable Tachometer Installation Instructions			

1.0 General Information

The VDO Programmable Tachometers featured in this installation manual are programmed with an inductive sender. These instructions describe the installation, wiring, calibration and operation of all such tachometers.

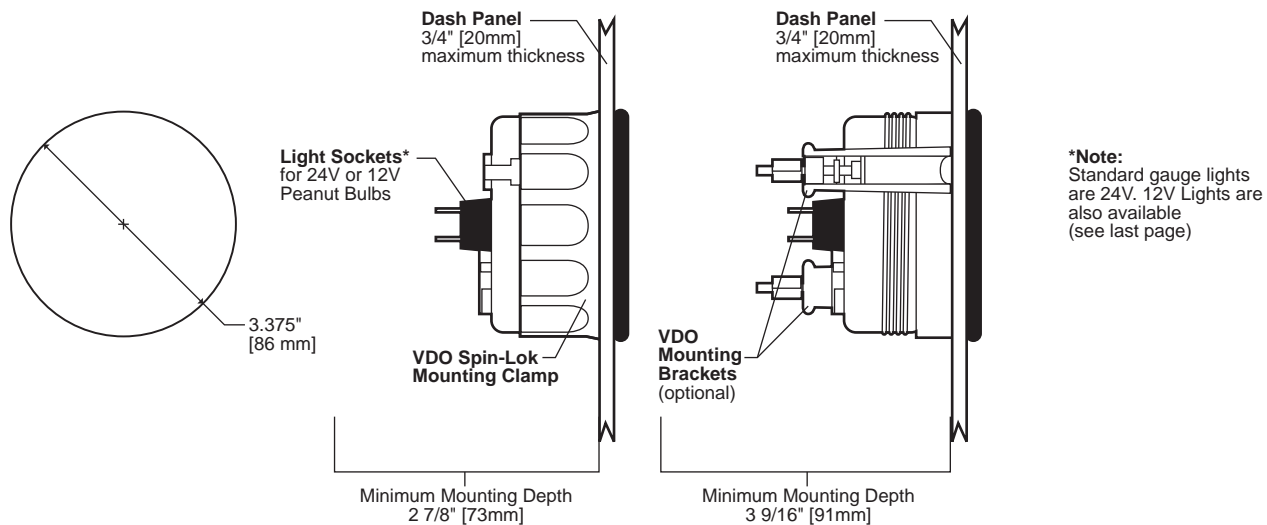
Each tachometer's analog display clearly shows the number of revolutions per minute (pump speed, not engine speed) and the LCD display shows the accumulated pump hours. The LCD display is also used for programming, calibration and fine-tuning of the tachometer (see diagram A).



Diagram A

2.0 Mounting the Tachometer

1. The 3 3/8"(85mm) tachometer requires a hole of 3 3/8". Mounting panel thickness cannot exceed 3/4"(20mm). Minimum mounting depth is 3 9/16"(91mm). Careful measurement and hole cutting are essential for proper gauge mounting.
2. Cut the hole using a hole saw. If you do not have a hole saw the exact size needed, use the closest smaller size and carefully widen the hole with a half-round file or similar device. If you plan to calibrate your tachometer, skip Step 3 and return after calibration is completed.
3. Place the tachometer in the opening and secure with the VDO Spin-Lok clamp provided (see diagram B). You may also mount the tachometer with a VDO mounting bracket and nuts (purchased separately).



*Note: Standard gauge lights are 24V. 12V Lights are also available (see last page)

Diagram B



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3.0 Wiring the Tachometer

1. Disconnect vehicle battery ground before performing this wiring. Prepare insulated 1/4"(6.3mm) spade terminals for use. Make sure all wires are long enough to reach the necessary positive and negative terminals and any wires from the sensor.
2. Connect the wire from pin #4 to a switched +12 or 24 DC volt source. A switched +12 or 24 DC volt wire can be found coming from the ignition switch (or pump engage switch). Follow this wire to a junction, and attach the wire from pin #4 at this junction - usually a fuse block (see diagram C).
3. Connect a wire from pin #5 to a constant +12 or +24 DC volt source.
4. Attach the wire from pin #3 to a ground (negative) source. One such source can be found where the battery is attached to the metal frame of the vehicle. Use an appropriate electrical connector to ground this wire.
5. Connect wire from pin #8 to the positive (+) tachometer signal source (usually a terminal on the inductive sender) using a butt splice and a crimping tool.
6. Attach the wire from pin #7 to the negative (-) terminal of the sender or floating ground (usually a terminal on the inductive sender) using a butt splice and crimping tool.
7. Crimp a spade connector onto a short piece of wire, and attach the connector to a terminal on one of the supplied lamp sockets. This lamp socket is referred to as Socket A in diagram C.
8. Crimp the other end of this short wire, along with a second piece of wire (long enough to reach the light switch) onto another spade connector. Attach this connector to a terminal on the remaining lamp socket, which will be referred to as Socket B in diagram C.
9. Crimp a spade connector onto an additional short piece of wire, and attach the connector to Socket A. Crimp the other end of this short wire, along with a second piece of wire (long enough to reach the selected ground termination) onto another spade connector. Attach this connector to Socket B. Attach remaining end of ground wire to selected ground termination.

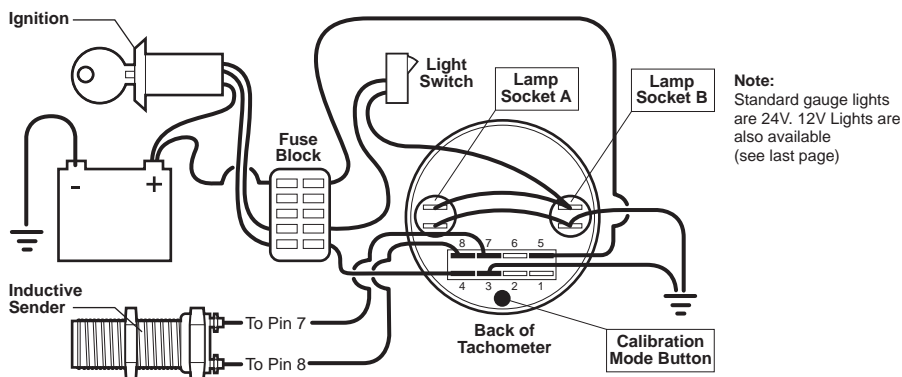


Diagram C

10. Reconnect the vehicle battery ground and turn on the ignition to see if the tachometer is working. The tachometer should perform an automatic self-test. During this self-test, the pointer moves over the whole scale range and the word "test" is visible in the LCD display (see Diagram D). After the test is complete, the display shows the current working hours on the engine hourmeter. Since this is the first time power has been applied, the reading should be 00000.0. * (see diagram D). If everything is working properly, the installation is complete. If not, check the wiring and all connections, and repeat self-test.



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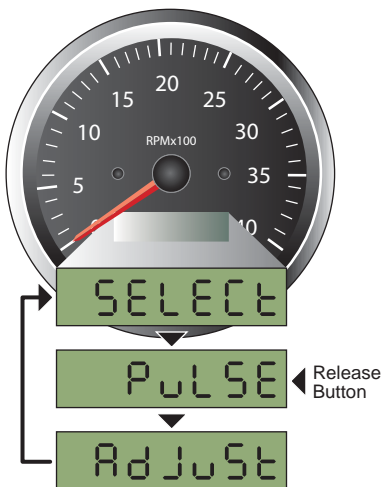
**Diagram D**

4.0 Calibrating the Tachometer

Calibration of the tachometer is a relatively simple procedure. It is accomplished by reading the pulse-per-revolution input from the diesel engine and ignition system.

To manually calibrate:

1. Access to the calibration mode (see diagram C) by pressing and holding the button on the back of the tachometer while turning on the ignition. As you continue to hold the button, the display will cycle through 3 calibration methods: "SELEct", "PuLSE", and "AdJuSt" (see diagram E). The display will stop for about 2 seconds on each word. When the display reads "PuLSE", release the button. This will begin pulse-per-mile mode calibration.

**Diagram E**

2. After a few seconds, the display will begin flashing a series of numbers (factory default settings) that can be changed to represent the pulse-per-revolution value of the inductive sender. For example, a number like "P 14.70" will be displayed, with each digit flashing in turn from right to left, except for the right-most digit, a zero, which is fixed.



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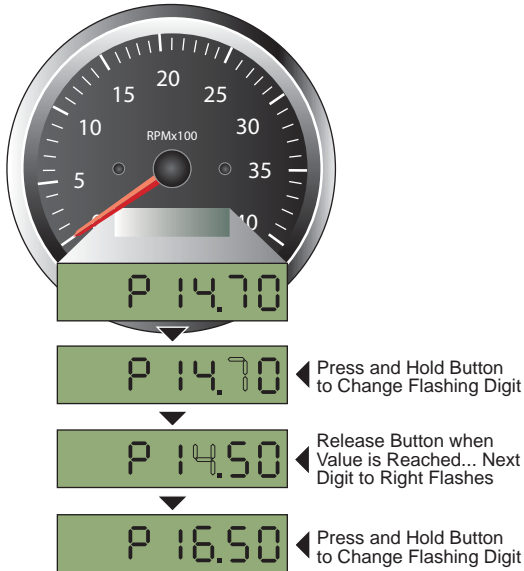


Diagram F

- As each number flashes, press and hold the button until the correct digit appears (see diagram F). Repeat for each digit. For example, if the diesel engine and ignition the system has a calibration value of 16.5 pulses-per-revolution, you would begin by setting the right-most digit (ignoring the zero) to 5 by holding the button until the digit reaches "5" and then releasing the button. The digit to the left of the "5" will flash. The button is held until this digit reads "6" and then it is released. The sequence is then repeated for the "1".
- After each digit is entered wait for the value to download to the tachometer's microprocessor. Calibration is now complete.

Note: The pulses-per-revolution for the Waterous HL inductive sender is factory preset to (4.00).

Gauge Lamp Accessories

Description	Voltage	Watts	VDO Part No.
Peanut Bulb (standard)	24V	1.2W	600 829
Peanut Bulb	12V	1.2W	600 809
Lamp Socket			600 840

