



# Programmable Tachometer

## IS0361

Rev. A ecn 9084 01/2014

### Operations Manual

This tachometer can be programmed to function with 4, 6 and 8 cylinder gasoline engines or with diesel engines, and can be used with most ignition coils including Alternator and Mag pickup inputs.

The analog looking dial and pointer sweep is driven by a digital stepper motor providing greater accuracy and dependability than magnetically wound gauges. You get the advantages of digital instrumentation with the look and feel of the analog gauges.



#### Caution

Disconnect the battery during installation. Tighten nuts on the back clamp only slightly more than you can tighten with your fingers. Six inch-pounds of torque are sufficient. Over tightening may result in damage to the instrument and may void your warranty. Use stranded, insulated wire not lighter than 18 AWG.

Be certain wire insulation is not in danger of melting from engine or exhaust heat or interfering with moving mechanical parts.

#### Parts

QTY	Description
1	Tachometer
1	Mounting Bracket
1	Hardware
8	#10 Brass Nut (3/8")
5	#10 Brass Flat Washer
5	#10 Split Washer

#### Installation

1. Location: Some interference (erratic operation) may be noticed on the tachometer during radio transmissions. This will neither damage a tachometer nor affect accuracy when not transmitting.

2. Cut a 3-3/8" (85 mm) dia hole in the dash and mount the tachometer with the backclamp supplied.

3. Connect a wire to the tachometer stud marked "BAT" (battery) and secure with a nut and lock washer.

Connect the opposite end to a 12VDC circuit that is activated by the ignition switch. It is recommended that insulated wire terminals, preferably ring type, be used on all connections to the tachometer, except the light, which requires a 1/4" insulated female blade terminal.

4. Connect a wire to the tachometer stud marked "SIG" (signal) and secure with a nut and lock washer.

Connect the opposite end to a terminal or wire originating from the unrectified side of the alternator or signal source. Tachometer plug-in harnesses are sometimes available from the engine manufacturer to simplify the hook-up.

5. Connect a wire to the tachometer stud marked "GND" (ground) and secure with a nut and lock washer.

Connect opposite end to the electrical ground, generally available in several locations at or near the instrument panel.

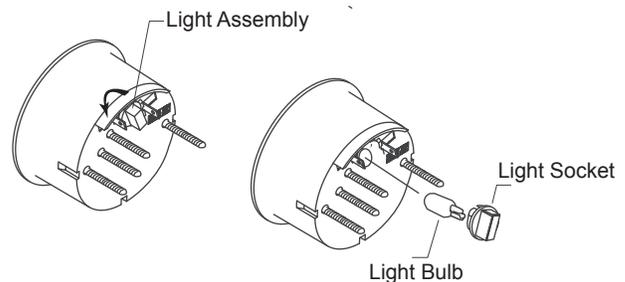
6. Connect the blade terminal adjacent to the twist-out light assembly to the positive "+" side of the instrument lighting circuit.

No separate ground is required for lighting.

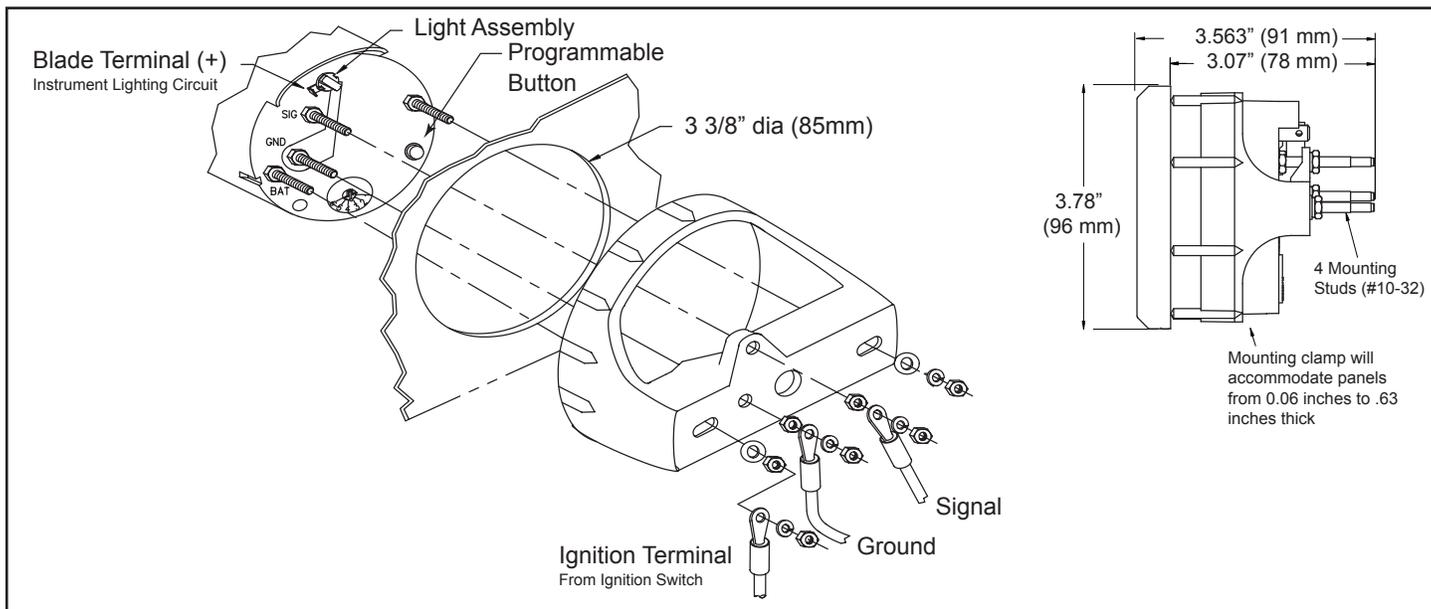
7. Reconnect the battery.

#### Light bulb replacement

To change light bulb, twist out black socket assembly one-eighth turn counterclockwise until it pops out. Bulb pulls straight out of assembly. It is a GE No. 194 instrument lamp.



## Wire Diagram



## Operation

When the Tachometer is turned on the LCD display indicates the Tachometer is performing a Self Test. There is no operator interaction.



When complete the Tachometer enters the "NORMAL" mode.

The Tachometer has two modes "NORMAL" and "SETUP".

"NORMAL" operation displays engine hours. When the Tachometer enters the "NORMAL" mode the LCD displays the hours recorded by the tachometer.



**Note:** There is no way to change the hours recorded on the Tachometer.

### Set Up

To get into "SETUP" mode, **hold the button down while powering up until the display shows "PULSE"**.



In the "SETUP" menu, a short button push will cycle through the selections; "PULSE", "AdJUST" and "End". A 3 second delay at the function, will select the function, LCD will flash, and the function is shown in the display.

### PULSE - Manual Calibration with a know source

"PULSE" will allow you to set the Pulse Per Revolutions (PPR). If you know the PPM being sent to your tachometer use "PULSE" to enter that value into the program.

With the program selected to "PULSE" use the button to enter the PPM.



Each digit will flash and a short push will increment it. Wait 3 seconds and the next digit will flash. This will continue for all digits and start over.

**Note:** Check with your engine manufacturer for the correct number of pulses per revolution data.

When you are done setting the PPM, a 3 second delay will save the setting and return to the main "PULSE" menu.

### Adjust -- Pointer Calibration

Use "AdJUST" to correct the pointer's position. If the pointer does not point to the expected RPM you can, with the Adjust function, reposition the pointer with in the calibration range of the tachometer. Set the engine above idle (2000 RPM) and compare the pointer position with that of the reference tachometer. If the pointer needs to be reposition use the "AdJUST" mode.

In the "SET UP" mode press the button to display "AdJUST". Allow 3 seconds to select the "AdJUST" manual calibration mode.



Press and hold the button. The value in the display increases or decreases.



To change direction of the value movement release the button then press and hold the button again.

If "UP" is displayed the value increases.

IF "dn" is displayed the value decreases.

The adjustment can be made from -30.0 to 100.0 in 1 or 5 increments if button is held for more than 5 seconds. When the pointer is in the correct position the adjustment is complete. The tachometer will exit to the "End" mode after 3 seconds of inactivity and saves the setting.

**Note:** It is recommended that this adjustment be done by an experienced technician with a reference tachometer.

### End

The "End" exits the "SETUP" menu and begin the "Self Test" mode.



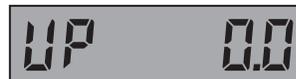
When complete the tachometer will return to the "NORMAL" mode after 3 seconds of inactivity.



### Fine Calibration

Fine calibration allows you to adjust the tachometer to the running speed or difference ratio of the engine and can compensate for alternator slippage at the different speeds. It is also helpful when synchronizing two engines.

While in the normal mode, a quick press of the button displays the Fine Calibration display.



Press and hold the button. The value in the display increases or decreases.

To change direction of the value movement release the button then press and hold the button again.

If "U" is displayed the value increases.

IF "d" is displayed the value decreases.

The calibration can be adjusted from -20.0 to 20.0 in 0.5 increments. When complete the tachometer will return to the "NORMAL" mode after 3 seconds of inactivity and saves the setting.

## Environmental

### Programmable Tachometer with Hourmeter

Calibration:	Tachometer: 0-4000 RPM Engine Hour Meter 0-999999.9	accurate to within $\pm 1\%$ of full scale accurate to within $\pm 1\%$ of reading
Environmental:	The electric Tachometer meets the requirements of SAE J1455 for normal, abnormal and extreme voltage variations also for operating and storage temperatures.	
Required Specs	Temperature	
Operating	-20°C - +85°C	
Storage	-40°C - +85°C	
Voltage:	Normal Operating	
Normal Operating	9 to 32 VDC	
Abnormal Voltage Conditions:	Over Voltage	
Over Voltage	36VDC for 60 minutes	
Reverse Polarity	The instrument can withstand reversed battery terminal polarity indefinitely without damage or permanent shift of calibration.	
Shock	50 +/- 2 G and a half sine duration of 11 +/- 2 ms. per MIL-STD-202, Method 213	
Vibration	4 G peak, 10 to 2000Hz SAE J1455 Appendix A	
Salt Spray	Front is Corrosion resistant per ASTM B117-73	
Water Leakage	Gauge is sealed from water entry from the front of gauge.	
Weather Resistance	Gauge has been tested to resist weather conditions.	

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