Caerbont Automotive Instruments

"The original makers of SMITHS Instruments"

Electronic Programmable Speedometer

Independently tested and approved to 95/54/EC

Designed and manufactured under ISO9001:2015 quality standard.

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Application Notes
The range of operation is 10 to 16 volts, nominally 12 volts, **Negative Earth Only.**

The speedometer must be calibrated to match the number of pulses per mile (or kilometre) generated by the speed sensor – this is achieved via the trip reset button. This must be completed with the speedometer powered and installed in the vehicle. The calibration range is up to 120,000 pulses per mile.

PIL042-F

Caution
Disconnect the negative battery cable prior to any installation

Harness connections		
Wire Colour	**Pin No.**	**Connect to**
Green	1	Switched ignition positive 12volt supply (via 3A fuse)
Brown/slate	2	Connected to ground trip reset switch
Red	3	Rarely used, only connected if sensor requires load resistance - *see note below*
White/Red	4	Instrument illumination 12volt supply (side light feed)
Black	5	Chassis or battery negative
White/Black	6	Speed signal, high voltage, often from GPS, ECU and many 3 wire sensors.
Red/blue	7	Speed signal input for low voltage output sensors (generally inductive)
Light green/purple	8	Not used

Note: Red wire connection is only used if the sensor input signal requires pulling high or low.
Connect to 12volts for NPN type sensors
Connect to 0volts (chassis) for PNP types

Calculating The Calibration Number
You need to know the number of times your wheels revolve per mile (or kilometre). Stand the vehicle on a flat surface and mark the tyre at the closest point to the ground, mark the ground at the same point. Move the vehicle forward by one complete wheel revolution and measure the distance travelled.

Wheel revs per mile = 63360 divided by the distance travelled in inches.

Wheel revs per km. = 1000 divided by the distance travelled in metres.

To Calculate the Calibration Number (pulses per mile/km). Drive Shaft or Prop Shaft

- For magnetic sensor, magnets or bolt heads moving past the sensor.

On PROP shaft
- Calibration number = (wheel revs per mile/km) x **(diff** ratio) x (number of magnets or bolts).

On DRIVE Shaft
- Calibration number = (wheel revs per mile/km) x (number of magnets or bolts).

- For sender driven from transmission cable drive.
Push vehicle forward on flat ground for 6 complete wheel revolutions and count the number of cable turns.
- Cable turns per mile (or km) = (Wheel revolutions per mile ÷ 6) x cable turns counted.
- Calibration number = Cable turns per mile (or km) x number of pulses per sender revolution.

Setting The Calibration – Inputting The Calibration Number / Pulses Per Unit Distance.

Firstly, the calibration number you have calculated should be rounded up to the nearest whole number, and secondly, when entering the number as described in the section below, and it is lower than 100,000, ensure you have the leading zero's on the left e.g. 008380.

There are two methods to setting the calibration:
(i) Manually inputting the PPU number.
(ii) Using 'drive to set' facility.

The calibration mode is selected by switching on the ignition while simultaneously pressing the trip reset button. The pointer will travel to full scale and return to zero.

If the button is released before the pointer returns to zero, the manual setting procedure will be selected and the LCD (ODO.) will read ‘SET PPU’
If the button is released after the pointer returns to zero, the ‘drive to set’ mode is selected, and the LCD will show ‘DTS PPU.’
At this point, pressing the reset button momentarily will toggle between ‘SET PPU’ and DTS PPU’

Manually Inputting the PPU Number
Set the LCD to display ‘SET PPU’ as described above.

Press the reset button for 2-3 seconds, the LCD will show the calibration number currently set. Each digit within the calibration number will flash in turn for approximately 2 seconds. When a digit is flashing, each depression of the reset button will increment the digit by one. Once the last (right-most) digit has been set/reset, the whole number will flash. Press the reset button and the LCD will display ‘DONE.’ After 3 seconds the LCD will display ‘SET PPU,’ the setting is now complete. Switch off the ignition.

Drive To Set PPU
Set the LCD to display ‘DTS PPU’ as described above.

Press the reset button for 2-3 seconds, the LCD will display ‘∗00000.’ Drive exactly one mile. While driving, the odometer will count the number of pulses generated by the sender.

Press the reset button for 2-3 seconds, the LCD will display ‘DONE.’ Within a few seconds the LCD will return to the ‘DTS PPU’, display. The setting is now complete. Switch off the ignition.

IMPORTANT – When driving in ‘drive to set’ mode the speedometer will register but not accurately. The speedometer cannot be used on a public highway in this mode.

If your new Speedometer has a manufacturing date of 01 20 or later located on its part number label, there is a possibility it has a new function allowing a one-off attempt at adding the existing mileage from your old speedometer to the new gauge.

Setting the Odometer to an existing mileage
This must be done **before** the odometer has clocked up **100 Miles or Kilometres**; this allows enough time to calibrate your speedometer first. Once this total is reached the Software locks out this new function.
Calibration mode is selected by switching on the ignition whilst holding the reset button for 3 seconds. Release the button, the speedometer is now in calibration mode. Do short presses to cycle round until it is displaying SETODO

Now press & hold the button until the display shows 6 zeros and release.

By momentarily pressing and releasing the reset button each number (extreme left side first) can be incremented to your desired value. Include leading zeros e.g.003859 When the value for each digit is correct release the button and wait 3 seconds.

The next number to change will flash, increment in the same way and continue until all the numbers are programmed to your new odometer reading.

At the end of the sequence all 6 digits will flash, during this time press and hold the button for 3 seconds and release and the display should say DONE. Power the gauge off and then on again and the saved mileage should be displayed.

If you make a mistake entering the numbers just switch off at any time before the end of the sequence and no changes will be saved.
If you have saved an incorrect number and it is greater than 000100 you will <u>NOT</u> be able to change it yourself and it will need to be returned to Caerbont to be stripped and either corrected or set back to zero. There would be a charge for doing this.

Tip: if you are close to 100 miles/Kilometres and the calibration is not correct reset it to 000000 and it gives you more time to calibrate correctly.