Caerbont Automotive Instruments

"The original makers of SMITHS Instruments"

Instructions for

Flight and Prism

Programmable Speedometers

Independently tested and approved to 95/54/EC

Designed and manufactured under ISO9001:2008 quality standard.

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Installation Guide

Flight & Prism range speedometers
Part numbers: FES3- and FES5- series
PES3- and PES5- series

Application Notes

The operating voltage is nominally 12 volts. The range of operation is 10 to 16 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 remote trip reset button. This must be completed with the speedometer powered and installed in the vehicle.
The calibration range is from 1,000 to 120,000 pulses per mile.

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 trip reset switch
Red	3	Used *only* if speed sensor requires load resistance - *see note below*
Red/white	4	Instrument illumination 12volt supply (side light feed)
Black	5	Chassis or battery negative
White/black	6	Speed signal input from ECU or wire sensor
Red/blue	7	Speed signal input for low voltage output 2 wire sensors (generally inductive)
Light green/purple	8	Not used

Note: Red wire connection is only required for some 3 wire sensors.
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)

- For magnetic sensor, magnets or bolt heads moving past the sensor (eg. prop shaft mounting).

- Calibration number = (wheel revs per mile/km) x (diff ratio) 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.

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

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.