



Caeront Automotive Instruments

"The original makers of SMITHS Instruments"

Instructions for *Electronic* *VW Replacement* Programmable Speedometer

Caeront Automotive Instruments Ltd
Abercrave, Swansea, SA9 1SH
Tel: +44 (0) 1639 732200
Fax: +44 (0) 1639 732201
www.caigauge.com

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 <i>only</i> if speed sensor requires load resistance
Blue	4	Indicator warning light. Current can only flow through the indicators led in one direction. Blue wire – indicator positive connection. Yellow – Indicator negative connection.
Yellow	12	Using conventional indicator relay, connect blue wire to terminal 49a, yellow wire to terminal 31.
Green/Blue	5	Main Beam warning light, Connect to main beam 12V positive feed.
Red/White	6	Instrument illumination positive 12volt supply (side light feed).
Black	7	Chassis or battery negative
White/Black	8	Speed signal for square wave input from hall effect, quenched oscillator and reed switch type senders and modern transistor output inductive/proximity sensors
Red/Blue	9	Speed signal for sine wave input from two wire inductive senders

Brown/Slate	10	Battery Warning light – connect to warning light output from alternator
Light Green/Purple	11	Oil Pressure Warning Light – connect to oil pressure switch. (Switch closes on falling pressure)

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.

Fitting Note:

Some vehicles are fitted with an additional speedometer bezel, also referred to as a 'beauty ring'. This ring should be removed prior to fitting speedometer. Once speedometer is fitted, reposition beauty ring around speedometer using appropriate adhesive to secure it.

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

There are two methods to setting the calibration:

- (i) Using 'drive to set' facility.
- (ii) Manually inputting the PPU number.

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'

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.

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.

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.