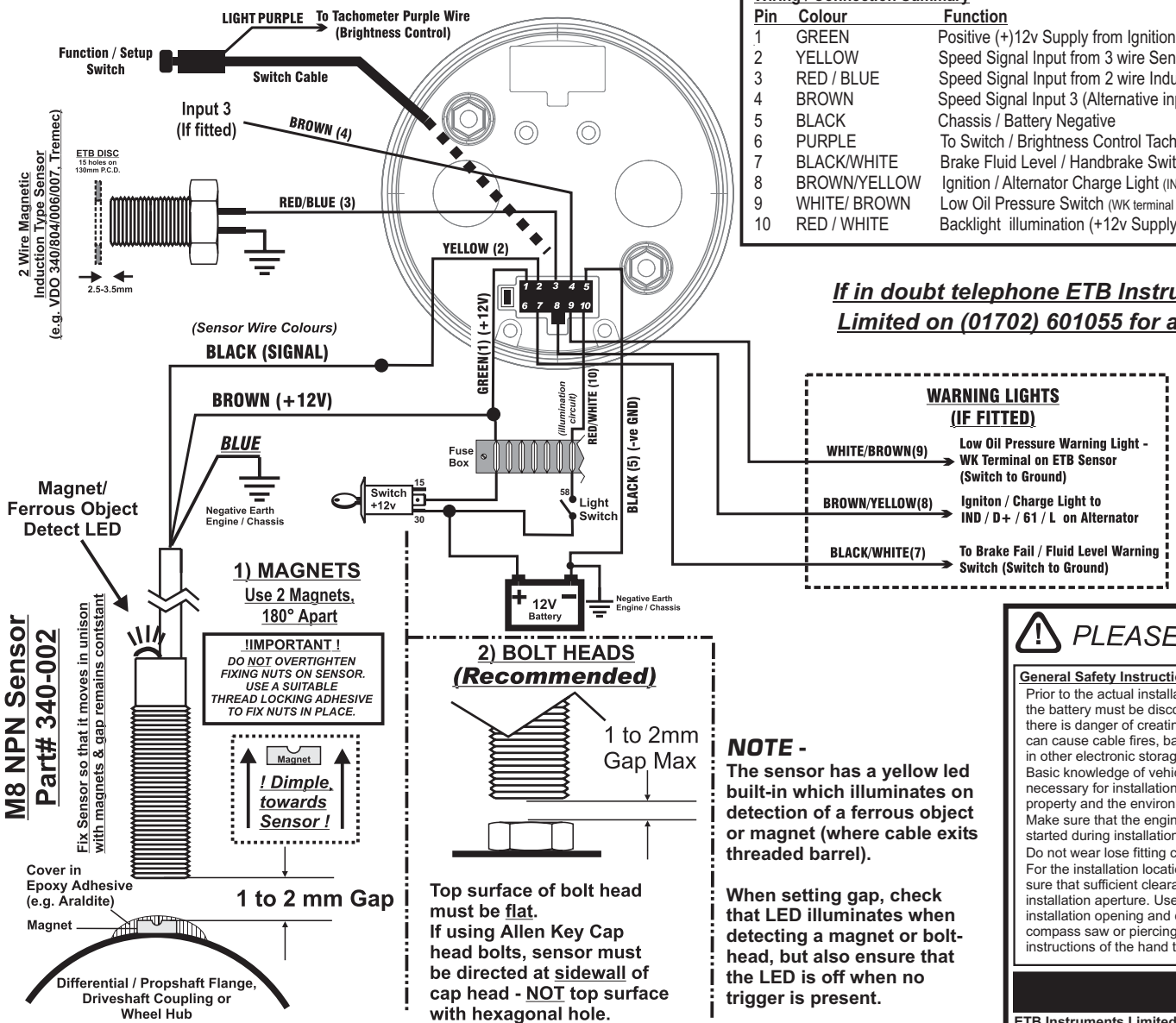
Programmable Speedometer - #1A-4408/10

NEGATIVE EARTH ONLY



If in doubt telephone ETB Instruments Limited on (01702) 601055 for advice!

Wiring / Connection Summary

Pin	Colour	Function
1	GREEN	Positive (+)12v Supply from Ignition Switch via Fuse box
2	YELLOW	Speed Signal Input from 3 wire Sensor or ECU
3	RED / BLUE	Speed Signal Input from 2 wire Inductive sensor
4	BROWN	Speed Signal Input 3 (Alternative input)
5	BLACK	Chassis / Battery Negative
6	PURPLE	To Switch / Brightness Control Tachometer *(Optional)*
7	BLACK/WHITE	Brake Fluid Level / Handbrake Switch *(if fitted)*
8	BROWN/YELLOW	Ignition / Alternator Charge Light (IND, D+, 61, L) *(if fitted)*
9	WHITE/ BROWN	Low Oil Pressure Switch (WK terminal on sensor) *(if fitted)*
10	RED / WHITE	Backlight illumination (+12v Supply from Light switch)

Wiring Instructions

1. Always disconnect the battery prior to installation.

2. Connect the BLACK wire on the speedometer to a good dedicated ground / earth location (i.e. where the negative (-) battery pole is connected to the chassis of the vehicle.

3. Connect the GREEN wire on the speedometer to a switched ignition +12 volt supply (via the fuse box. A 3 Amp fuse is recommended)

4.The signal input should be connected in either of the following ways:-

a) M8 NPN SENSOR 340 002 -
The ***BLACK*** signal output wire from the sensor should be connected to the **YELLOW** wire on the speedometer. Connect the ***BROWN*** wire on the sensor to a fused, switched +12v supply, and the ***BLUE*** sensor wire to a good ground / negative earth location.

b) 2 Wire Magnetic Induction Sensors - Connect the RED/BLUE wire to one terminal on the sensor & the other wire negative earth. It does NOT matter which way round you wire the sensor to the speedometer.

c) 3 Wire Hall-effect / OEM Gearbox Sensors - Usually if there are 3 wires, (+12v supply, GND and signal out) the signal output is connected to the YELLOW wire on the speedometer. Please contact the sensor / vehicle manufacturer to obtain the wiring specification of gearbox sensor, or alternatively please contact ETB Instruments Limited on (01702) 601055 for advice.

NOTE -
The sensor has a yellow led built-in which illuminates on detection of a ferrous object or magnet (where cable exits threaded barrel).

When setting gap, check that LED illuminates when detecting a magnet or bolt-head, but also ensure that the LED is off when no trigger is present.

SETTING UP THE HALL - EFFECT SENSOR
Regardless of whether magnets, bolt heads or ETB's Speedometer Disc are used with the hall-effect sensor, the most important factor is to ensure that as the shaft or hub rotates with vehicle speed, the gap between the sensor and trigger (e.g. magnet or bolt head) remains constant. To ensure this gap remains constant, the sensor must be bolted to a location that moves in unison with the trigger. For example, if placing magnets on the outside circumference of a drive-shaft coupling, the sensor must be fixed to the gearbox or differential.

FIXING MAGNETS
Clean the surface to be used, attach the magnet,(which will stay in place if the surface is ferrous) and apply a fixing adhesive (e.g. araldite or chemical metal) over the magnet to permanently hold it in place. If possible, it is preferable to drill a small, 6mm diameter hole, approximately 1 mm deep to locate the magnet and then smother in a strong adhesive.

PLEASE READ FIRST!

General Safety Instructions for ALL Instruments

Prior to the actual installation work, the negative pole of the battery must be disconnected first, since otherwise there is danger of creating short circuits. Short circuits can cause cable fires, battery explosions, and damages in other electronic storage systems.
Basic knowledge of vehicle electrics and mechanics is necessary for installation to prevent harm to people, property and the environment.
Make sure that the engine cannot be unintentionally started during installation.
Do not wear lose fitting clothes!
For the installation location of the equipment unit, make sure that sufficient clearance is provided behind the installation aperture. Use a drill to pre-drill the installation opening and complete the opening using a compass saw or piercing saw (observe the safety instructions of the hand tool manufacturer.)

Electrical Wiring Safety Instructions for ALL Instruments

- Prior to the actual installation work, the negative pole of the battery must be disconnected first, since otherwise there is danger of creating short circuits. Short circuits can cause cable fires, battery explosions, and damages in other electronic storage systems.
- Connect the cables in accordance with the electrical connection diagram
- Take account of the cable cross section - a reduction in cable cross section results in a higher current density. This can cause the cable to heat up.
- When laying electric cables, use existing cable ducts and routes but without laying cables parallel to ignition or cables leading to high current consumers. Fix the cables with cable tape or adhesive tape.
- Do not route the cables over mobile components.
- Do not fasten cables to the steering column.
- Make sure that the cables are not exposed to tensile, compressive or shear forces.
- If the cables are routed through drilled holes, protect them with rubber sleeves or the like.
- Strip cables only with a cable stripper. Adjust the stripper so that no strands are damaged or severed.
- Crimp connections should only be made with a crimping tool.
- Insulate exposed strands so that no short circuiting can occur.

ETB Limited Warranty

ETB Instruments Limited warrants all merchandise against defects in factory workmanship and materials for a period of 12 months from date of purchase. This warranty applies to the first retail purchaser and covers only those products exposed to normal use or service. Provisions of the warranty shall not apply to an ETB product used for a purpose for which it is not designed, or which has been altered in any way that would be detrimental to the performance or life of the product, or misapplication, misuse, negligence or accident. On any part or product found to be defective after examination by ETB Instruments Limited, ETB Instruments Limited will only repair or replace the merchandise through the original selling dealer or on a direct basis. ETB Instruments Limited assumes no responsibility for diagnosis, removal and/or installation labour, loss of vehicle use, loss of time, inconvenience or any other consequential expenses. In the event of merchandise being returned to ETB Instruments Limited, The responsibility for payment of delivery rests with the customer. The warranties herein are in lieu of any other expressed or implied warranties, including any implied warranty of merchantability or fitness, and any other obligation on the part of ETB Instruments Limited, or selling dealer. Your statutory rights as a consumer are not affected.

Speedometer Setup / Calibration / Function

1. SETUP MODE

To enter setup mode, press function switch and keep pressed. Switch on ignition to power up instrument. Setup mode is selected as shown:
SETUP
MODE
Release button. Press button once to advance to next LCD menu screen.

1.1 CALIBRATION

2 Options to Calibrate :-
a) SET PULSES (per mile or km) OR b) AUTOCAL (Drive measure mile or km)

a) **SET PULSES** - This is the number of pulses (per mile or km depending on unit of measurement on the main scale of the speedometer) that the speed sensor generates per unit of travel (mile or km). The number of pulses is dependent on the speed sensor location:

i) Wheel hub or driveshaft location = Tyre rotations per mile (or km) **x** Number of trigger points (e.g. bolt heads or magnets)

ii) Prop-shaft Location = Tyre rotations per mile (or km) **x** Number of trigger points (e.g. bolt heads) **x** Differential Ratio (e.g. **3.62**:1)

iii) Gearbox Sensor = Tyre rotations per mile (or km) **x** Differential Ratio (e.g. **3.62**:1) **x** Number of pulses per sensor revolution
Gearbox speedometer drive ratio (e.g. 3.43)

Press and hold function button for 2 seconds in SET PULSES LCD screen. The LCD changes to:
Pulses
006000 The first column will flash. Press the button once to cycle through numbers 0-9. Once desired number is shown in column, press and hold button for 2 seconds to advance to the next column to the left. Repeat procedure until the correct pulse number is shown. On the last column, once desired number is selected, by pressing button and holding function button for 2 seconds, a "*" appears confirming storage of the number in memory. The speedometer will automatically return to main odometer screen after 2 seconds.

b) **AUTOCAL** - By driving the vehicle over a set distance (mile or km) on a test track, the speedometer counts the number of pulses received from the speed sensor. You will need to note the start and end points of a measured mile / km using another vehicle before carrying out this procedure.

Press and hold function button for 2 seconds in AUTOCAL LCD screen. The LCD changes to:
Start
000000 Start the measuring drive. (*During the drive you will see a speed shown on the speedometer - please ignore this.)* As you drive, you will see the LCD begin counting pulses received from the sensor. At the end of the mile or km, press the function button once. The counter will stop and a * will appear to confirm that the pulse number has been stored in memory. Please note that this function should not be used on public roads.

1.2 TIMER STOP (Acceleration Timer for 0-60 / 100 etc.)

Timer
Stop - This is to set the speed at which the timer will stop. Set the desired number for each column by pressing the button once to cycle through 0-9. Press and hold button for 2 seconds to advance to next column. Once desired number is set, press and hold for 2 seconds and a * will appear confirming storage in memory. After 2 seconds the LCD will return to mileage display.

1.3 SENSOR INPUT

This is for selecting a particular sensor input. This setting should be left in "AUTO" for automatic sensor input recognition.

1.4 CONTRAST

The contrast level of the LCD odometer can be adjusted as desired.

2. Main Function LCD Screens

To cycle through the main LCD screens press the button once.

2.1 Total Distance Odometer

Total
000000.0 - This is the total distance (miles or km depending on main scale of speedometer) recorded by the vehicle. This distance cannot be reset.

2.2 Trip Counter 1

Trip 1
0000.0 - The speedometer has 2 resettable trip counters. To reset a trip counter to zero, press and hold the function button for 2 seconds.

2.3 Trip Counter 2

Trip 2
0000.0 - As 2.2.

2.4 Acceleration Timer

0->60
T:0000.0 - The speedometer has an acceleration timer built in. The speed at which the timer stops recording the time in seconds can be set by entering Setup mode / Timer Stop (see 1.2). To use the timer, go to the start line of the measuring track. Press and hold the function button for 2 seconds to reset the timer to zero. The timer will automatically start upon detection of the 1st input pulse from the speed sensor, and stop once the preset stop speed is reached.

2.5 ¼ Mile Timer

1/4 Mile
T:0000.0 - The speedometer can record ¼ mile times. To use the timer, go to the start line of the measuring track. Press and hold the function button for 2 seconds to reset the timer to zero. The timer will automatically start upon detection of the 1st input pulse from the speed sensor, and stop once a 1/4 mile distance has been recorded.

2.6 Max (Peak) Speed Memory

Speed
Max:000 - The speedometer will store the maximum speed (Mph or Km/h depending on speedometer) attained by the vehicle. To reset to zero, press and hold function button for 2 seconds. The maximum speed will be stored in memory indefinitely until reset by the user.

2.7 Brightness

Brightns
100% - The brightness level of the speedometer illumination can be adjusted between 0% and 100%. To adjust the brightness level, press and hold function button until a "+" appears. The brightness level can now be adjusted by pressing the function button to advance in 10% intervals. Once the desired level of brightness is reached, press and hold the function button for 2 seconds. A "*" will appear confirming that the new level has been stored in memory.
Note - if the purple wire has been connected to the purple wire from the tachometer, this adjustment will automatically update the brightness level of the tachometer to match.