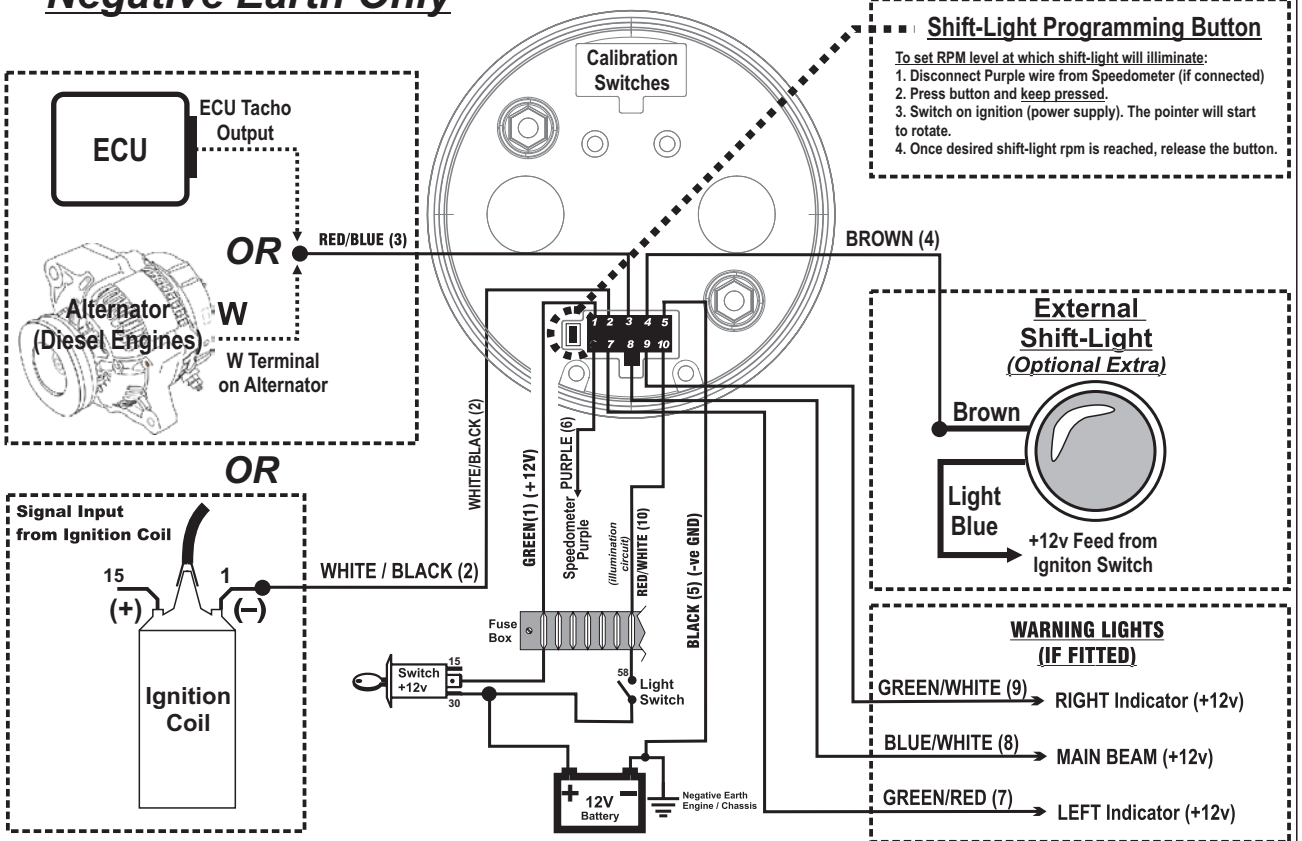
Electronic Tachometer - #1A-3508/10

Negative Earth Only



Notes on Installation

A. Calibration

1. Before installing the tachometer in the vehicle, calibrate the tachometer using the switches on the backof the unit. In order to calibrate the tachometer to match the vehicle, please refer to the switch calibration table on the reverse side of this sheet.

B. Wiring

2. Always disconnect the battery prior to installation.
3. Connect the BLACK wire on the Tachometer to a good dedicated ground / earth location. (i.e. where the negative (-) battery pole is connected to the chassis of the vehicle.)
4. Connect the GREEN wire on the Tachometer to a switched ignition +12 volt supply via the fuse box. , (A 3 Amp fuse is recommended)
5. The signal input should be connected in either of the following ways:-

Petrol Engines

a) For conventional contact breaker ignition systems, the White/Black signal wire should be connected to the negative (-ve) side of the Ignition Coil.

b) Engines using electronic ignition modules or an ECU that have their own output wire for a tachometer - the output should be connected to the Red/Blue signal input wire.

(For petrol engines with specialist ignition systems that are not equipped with a conventional ignition coil (e.g. transistor coil ignition systems, electronic and fully electronic ignition systems), please ask for information on the tachometer connection from the manufacturer of the vehicle, engine or ignition system.)

Diesel Engines

c) The Red/Blue wire should be connected to the 'W' Terminal on the alternator.

Wiring / Connection Summary

Pin	Colour	Function
1	GREEN	Positive (+)12v Supply from Ignition Switch via Fuse box
2	WHITE / BLACK	Ignition Coil Input (Negative Side) ((-) or 1))
3	RED / BLUE	ECU Input or Alternator 'W' terminal (diesel engines)
4	BROWN	External Shift Light Control *(Shift-Light Optional Extra)*
5	BLACK	Chassis / Battery Negative
6	PURPLE	Illumination Brightness Control via Speedometer *(Optional)*
7	GREEN / RED	LEFT Indicator *(if fitted)*
8	BLUE / WHITE	MAIN Beam *(if fitted)*
9	GREEN / WHITE	RIGHT Indicator *(if fitted)*
10	RED / WHITE	Backlight Illumination (+12v Supply from Light switch)

If in doubt, please telephone ETB Instruments Limited on (01702) 601055.

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.)

NEGATIVE EARTH ONLY

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

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.

Calibration

Prior to installing the tachometer in the vehicle, 8 switches on the back of the tachometer are used for calibrating the tachometer.

Firstly ensure that the power is disconnected.

A. Petrol Engines / Coil Input

PPR = Number of Pulses Per Revolution

For single spark systems the PPR Number is effectively ½ the number of cylinders:

No. of Cyl.	Single Spark / PPR	Wasted Spark / PPR
1	0.5	1
2	1	2
3	1.5	3
4	2	4
5	2.5	5
6	3	6
8	4	8
10	5	10
12	6	12

B. Diesel Engines

For diesel engines using a W terminal on the alternator for signal input, the PPR is calculated as follows:

$$\frac{\text{Crankshaft Pulley Diameter}}{\text{Alternator Pulley Diameter}} \times \text{No. of Alternator Poles}$$

Example - (110mm / 48mm) x 12 = 27.5 PPR

Switch Setting - 0 = OFF / 1 = ON

	SWITCH NUMBER								
PPR	1	2	3	4	5	6	7	8	Hz/ 1000
0.5	1	0	0	0	0	0	0	0	8.33
1	0	1	0	0	0	0	0	0	16.67
1.5	1	1	0	0	0	0	0	0	25.00
2	0	0	1	0	0	0	0	0	33.33
2.5	1	0	1	0	0	0	0	0	41.67
3	0	1	1	0	0	0	0	0	50.00
4	1	1	1	0	0	0	0	0	66.67
5	0	0	0	1	0	0	0	0	83.33
6	1	0	0	1	0	0	0	0	100.00
7	0	1	0	1	0	0	0	0	116.67
8	1	0	1	1	0	0	0	0	133.33
8.1	0	0	1	1	0	0	0	0	135.00
8.2	1	1	0	1	0	0	0	0	136.67
8.3	0	1	1	1	0	0	0	0	138.33
8.4	1	1	1	1	0	0	0	0	140.00
8.5	0	0	0	0	1	0	0	0	141.67
8.6	1	0	0	0	1	0	0	0	143.33
8.7	0	1	0	0	1	0	0	0	145.00
8.8	1	1	0	0	1	0	0	0	146.67
8.9	0	0	1	0	1	0	0	0	148.33
9	1	0	1	0	1	0	0	0	150.00
9.1	0	1	1	0	1	0	0	0	151.67
9.2	1	1	1	0	1	0	0	0	153.33
9.3	0	0	0	1	1	0	0	0	155.00
9.4	1	0	0	1	1	0	0	0	156.67
9.5	0	1	0	1	1	0	0	0	158.33
9.6	1	1	0	1	1	0	0	0	160.00
9.7	0	0	1	1	1	0	0	0	161.67
9.8	1	0	1	1	1	0	0	0	163.33
9.9	0	1	1	1	1	0	0	0	165.00
10	0	1	1	1	1	1	0	0	166.67
10.1	0	0	0	0	0	1	0	0	168.33
10.2	1	0	0	0	0	1	0	0	170.00
10.3	0	1	0	0	0	1	0	0	171.67
10.4	1	1	0	0	0	1	0	0	173.33
10.5	0	0	1	0	0	1	0	0	175.00
10.6	1	0	1	0	0	1	0	0	176.67
10.7	0	1	1	0	0	1	0	0	178.33
10.8	1	1	1	0	0	1	0	0	180.00
10.9	0	0	0	1	0	1	0	0	181.67
11	1	0	0	1	0	1	0	0	183.33
11.1	0	1	0	1	0	1	0	0	185.00
11.2	1	1	0	1	0	1	0	0	186.67
11.3	0	0	1	1	0	1	0	0	188.33
11.4	1	0	1	1	0	1	0	0	190.00
11.5	0	1	1	1	0	1	0	0	191.67
11.6	1	1	1	1	0	1	0	0	193.33
11.7	0	0	0	0	1	1	0	0	195.00
11.8	1	0	0	0	1	1	0	0	196.67
11.9	0	1	0	0	1	1	0	0	198.33
12	1	1	0	0	1	1	0	0	200.00
12.1	0	0	1	0	1	1	0	0	201.67
12.2	1	0	1	0	1	1	0	0	203.33
12.3	0	1	1	0	1	1	0	0	205.00
12.4	1	1	1	0	1	1	0	0	206.67
12.5	0	0	0	1	1	1	0	0	208.33
12.6	1	0	0	1	1	1	0	0	210.00
12.7	0	1	0	1	1	1	0	0	211.67
12.8	1	1	0	1	1	1	0	0	213.33
12.9	0	0	1	1	1	1	0	0	215.00
13	1	0	1	1	1	1	0	0	216.67
13.1	0	1	1	1	1	1	0	0	218.33
13.2	1	1	1	1	1	1	0	0	220.00
13.3	0	0	0	0	0	0	1	0	221.67
13.4	1	0	0	0	0	0	1	0	223.33
13.5	0	1	0	0	0	0	1	0	225.00
13.6	1	1	0	0	0	0	1	0	226.67
13.7	0	0	1	0	0	0	1	0	228.33
13.8	1	0	1	0	0	0	1	0	230.00
13.9	0	1	1	0	0	0	1	0	231.67
14	1	1	1	0	0	0	1	0	233.33
14.1	0	0	0	1	0	0	1	0	235.00
14.2	1	0	0	1	0	0	1	0	236.67
14.3	0	1	0	1	0	0	1	0	238.33
14.4	1	1	0	1	0	0	1	0	240.00
14.5	0	0	1	1	0	0	1	0	241.67
14.6	1	0	1	1	0	0	1	0	243.33
14.7	0	1	1	1	0	0	1	0	245.00
14.8	1	1	1	1	0	0	1	0	246.67
14.9	0	0	0	0	1	0	1	0	248.33
15	1	0	0	0	1	0	1	0	250.00
15.1	0	1	0	0	1	0	1	0	251.67
15.2	1	1	0	0	1	0	1	0	253.33
15.3	0	0	1	0	1	0	1	0	255.00
15.4	1	0	1	0	1	0	1	0	256.67
15.5	0	1	1	0	1	0	1	0	258.33
15.6	1	1	1	0	1	0	1	0	260.00
15.7	0	0	0	1	1	0	1	0	261.67
15.8	1	0	0	1	1	0	1	0	263.33
15.9	0	1	0	1	1	0	1	0	265.00
16	1	1	0	1	1	0	1	0	266.67
16.1	0	0	1	1	1	0	1	0	268.33
16.2	1	0	1	1	1	0	1	0	270.00
16.3	0	1	1	1	1	0	1	0	271.67
16.4	1	1	1	1	1	0	1	0	273.33
16.5	0	0	0	0	0	1	1	0	275.00
16.6	1	0	0	0	0	1	1	0	276.67
16.7	0	1	0	0	0	1	1	0	278.33
16.8	1	1	0	0	0	1	1	0	280.00
16.9	0	0	1	0	0	1	1	0	281.67
17	1	0	1	0	0	1	1	0	283.33
17.1	0	1	1	0	0	1	1	0	285.00
17.2	1	1	1	0	0	1	1	0	286.67
17.3	0	0	0	1	0	1	1	0	288.33
17.4	1	0	0	1	0	1	1	0	290.00
17.5	0	1	0	1	0	1	1	0	291.67
17.6	1	1	0	1	0	1	1	0	293.33
17.7	0	0	1	1	0	1	1	0	295.00
17.8	1	0	1	1	0	1	1	0	296.67
17.9	0	1	1	1	0	1	1	0	298.33
18	1	1	1	1	0	1	1	0	300.00
18.1	0	0	0	0	1	1	1	0	301.67
18.2	1	0	0	0	1	1	1	0	303.33
18.3	0	1	0	0	1	1	1	0	305.00
18.4	1	1	0	0	1	1	1	0	306.67
18.5	0	0	1	0	1	1	1	0	308.33
18.6	1	0	1	0	1	1	1	0	310.00
18.7	0	1	1	0	1	1	1	0	311.67
18.8	1	1	1	0	1	1	1	0	313.33
18.9	0	0	0	1	1	1	1	0	315.00
19	1	0	0	1	1	1	1	0	316.67
19.1	0	1	0	1	1	1	1	0	318.33
19.2	1	1	0	1	1	1	1	0	320.00
19.3	0	0	1	1	1	1	1	0	321.67
19.4	1	0	1	1	1	1	1	0	323.33
19.5	0	1	1	1	1	1	1	0	325.00
19.6	1	1	1	1	1	1	1	0	326.67
19.7	0	0	0	0	0	0	0	1	328.33
19.8	1	0	0	0	0	0	0	1	330.00
19.9	0	1	0	0	0	0	0	1	331.67
20	1	1	0	0	0	0	0	1	333.33
20.1	0	0	1	0	0	0	0	1	335.00
20.2	1	0	1	0	0	0	0	1	336.67
20.3	0	1	1	0	0	0	0	1	338.33
20.4	1	1	1	0	0	0	0	1	340.00
20.5	0	0	0	1	0	0	0	1	341.67
20.6	1	0	0	1	0	0	0	1	343.33
20.7	0	1	0	1	0	0	0	1	345.00
20.8	1	1	0	1	0	0	0	1	346.67
20.9	0	0	1	1	0	0	0	1	348.33
21	1	0	1	1	0	0	0	1	350.00
21.1	0	1	1	1	0	0	0	1	351.67
21.2	1	1	1	1	0	0	0	1	353.33
21.3	0	0	0	0	1	0	0	1	355.00
21.4	1	0	0	0	1	0	0	1	356.67
21.5	0	1	0	0	1	0	0	1	358.33
21.6	1	1	0	0	1	0	0	1	360.00
21.7	0	0	1	0	1	0	0	1	361.67
21.8	1	0	1	0	1	0	0	1	363.33
21.9	0	1	1	0	1	0	0	1	365.00
22	1	1	1	0	1	0	0	1	366.67
22.1	0	0	0	1	1	0	0	1	368.33
22.2	1	0	0	1	1	0	0	1	370.00
22.3	0	1	0	1	1	0	0	1	371.67
22.4	1	1	0	1	1	0	0	1	373.33
22.5	0	0	1	1	1	0	0	1	375.00
22.6	1	0	1	1	1	0	0	1	376.67
22.7	0	1	1	1	1	0	0	1	378.33
22.8	1	1	1	1	1	0	0	1	380.00
22.9	0	0	0	0	0	1	0	1	381.67
23	1	0	0	0	0	1	0	1	383.33
23.1	0	1	0	0	0	1	0	1	385.00
23.2	1	1	0	0	0	1	0	1	386.67
23.3	0	0	1	0	0	1	0	1	388.33
23.4	1	0	1	0	0	1	0	1	390.00
23.5	0	1	1	0	0	1	0	1	391.67
23.6	1	1	1	0	0	1	0	1	393.33
23.7	0	0	0	1	0	1	0	1	395.00
23.8	1	0	0	1	0	1	0	1	396.67
23.9	0	1	0	1	0	1	0	1	398.33
24	1	1	0	1	0	1	0	1	400.00
24.1	0	0	1	1	0	1	0	1	401.67
24.2	1	0	1	1	0	1	0	1	403.33
24.3	0	1	1	1	0	1	0	1	405.00
24.4	1	1	1	1	0	1	0	1	406.67
24.5	0	0	0	0	1	1	0	1	408.33
24.6	1	0	0	0	1	1	0	1	410.00
24.7	0	1	0	0	1	1	0	1	411.67
24.8	1	1	0	0	1	1	0	1	413.33
24.9	0	0	1	0	1	1	0	1	415.00
25	1	0	1	0	1	1	0	1	416.67
25.1	0	1	1	0	1	1	0	1	418.33
25.2	1	1	1	0	1	1	0	1	420.00
25.3	0	0	0	1	1	1	0	1	421.67
25.4	1	0	0	1	1	1	0	1	423.33
25.5	0	1	0	1	1	1	0	1	425.00
25.6	1	1	0	1	1	1	0	1	426.67
25.7	0	0	1	1	1	1	0	1	428.33
25.8	1	0	1	1	1	1	0	1	430.00
25.9	0	1	1	1	1	1	0	1	431.67
26	1	1	1	1	1	1	0	1	433.33
26.1	0	0	0	0	0	0	1	1	435.00
26.2	1	0	0	0	0	0	1	1	436.67
26.3	0	1	0	0	0	0	1	1	438.33
26.4	1	1	0	0	0	0	1	1	440.00
26.5	0	0	1	0	0	0	1	1	441.67
26.6	1	0	1	0	0	0	1	1	443.33
26.7	0	1	1	0	0	0	1	1	445.00
26.8	1	1	1	0	0	0	1	1	446.67
26.9	0	0	0	1	0	0	1	1	448.33
27	1	0	0	1	0	0	1	1	450.00
27.1	0	1	0	1	0	0	1	1	451.67
27.2	1	1	0	1	0	0	1	1	453.33
27.3	0	0	1	1	0	0	1	1	455.00
27.4	1	0	1	1	0	0	1	1	456.67
27.5	0	1	1	1	0	0	1	1	458.33
27.6	1	1	1	1	0	0	1	1	460.00
27.7	0	0	0	0	1	0	1	1	461.67
27.8	1	0	0	0	1	0	1	1	463.33
27.9	0	1	0	0	1	0	1	1	465.00
28	1	1	0	0	1	0	1	1	466.67
28.1	0	0	1	0	1	0	1	1	468.33
28.2	1	0	1	0	1	0	1	1	470.00
28.3	0	1	1	0	1	0	1	1	471.67
28.4	1	1	1	0	1	0	1	1	473.33
28.5	0	0	0	1	1	0	1	1	475.00
28.6	1	0	0	1	1	0	1	1	476.67
28.7	0	1	0	1	1	0	1	1	478.33
28.8	1	1	0	1	1	0	1	1	480.00
28.9	0	0	1	1	1	0	1	1	481.67
29	1	0	1	1	1	0	1	1	483.33
29.1	0	1	1	1	1	0	1	1	485.00
29.2	1	1	1	1	1	0	1	1	486.67
29.3	0	0	0	0	0	1	1	1	488.33
29.4	1	0	0	0	0	1	1	1	490.00
29.5	0	1	0	0	0	1	1	1	491.67
29.6	1	1	0	0	0	1	1	1	493.33
29.7	0	0	1	0	0	1	1	1	495.00
29.8	1	0	1	0	0	1	1	1	496.67
29.9	0	1	1	0	0	1	1	1	498.33
30	1	1	1	0	0	1	1	1	500.00
30.1	0	0	0	1	0	1	1	1	501.67
30.2	1	0	0	1	0	1	1	1	503.33
30.3	0	1	0	1	0	1	1	1	505.00
30.4	1	1	0	1	0	1	1	1	506.67
30.5	0	0	1	1	0	1	1	1	508.33
30.6	1	0	1	1	0	1	1	1	510.00
30.7	0	1	1	1	0	1	1	1	511.67
30.8	1	1	1	1	0	1	1	1	513.33
30.9	0	0	0	0	1	1	1	1	515.00
31	1	0	0	0	1	1	1	1	516.67
31.1	0	1	0	0	1	1	1	1	518.33
31.2	1	1	0	0	1	1	1	1	520.00
31.3	0	0	1	0	1	1	1	1	521.67
31.4	1	0	1	0	1	1	1	1	523.33
31.5	0	1	1	0	1	1	1	1	525.00
31.6	1	1	1	0	1	1	1	1	526.67
31.7	0	0	0	1	1	1	1	1	528.33
31.8	1	0	0	1	1	1	1	1	530.00
31.9	0	1	0	1	1	1	1	1	531.67
32	1	1	0	1	1	1	1	1	533.33
32.1	0	0	1	1	1	1	1	1	535.00
32.2	1	0	1	1	1	1	1	1	536.67
32.3	0	1	1	1	1	1	1	1	538.33
32.4	1	1	1	1	1	1	1	1	540.00