

Interfacing the dashboard of an ITL Hoshiarpur tractor for the Heagle project

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Abstract

The Heagle project is an attempt to design and build an electric tractor. For this project I am designing an interface between the existing dashboard and the electric motor drive.

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Figure 1: The Heagle

1 Pin out dashboard electric tractor



Figure 2: Dashboard

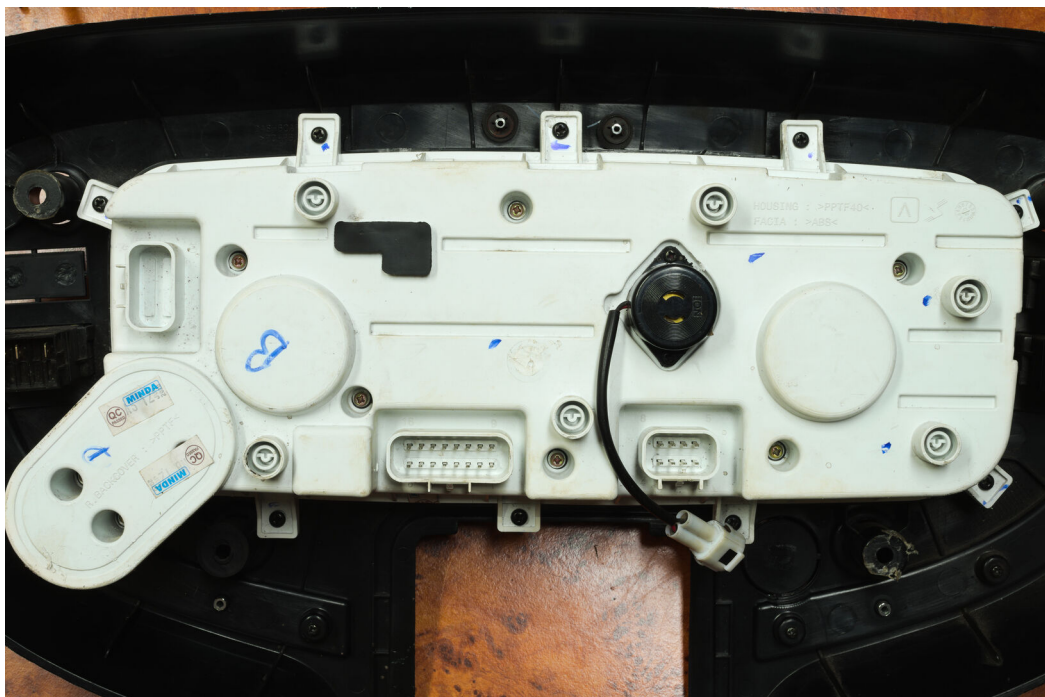


Figure 3: Dashboard back side

1.1 16 Pin connector



Figure 4: 16 Pin connector

Pin	Color	Function
1		
2		
3	Yellow/Blue	Temperature
4	Violet	Fuel Gauge
5	Blue/Red	BAT +VE
6	Green	RPM
7	Black	Neutral
8	Black/Yellow	IGN +VE
9		
10		
11	Green/White	Air filter
12	Yellow/White	Bat. Dischr
13		
14		
15		
16		

1.2 8 Pin connector



Figure 5: 8 Pin connector

Pin	Color	Function
1	Yellow	Service
2		
3		
4	Brown/Yellow	Low Oil
5		
6		
7	Brown	Glow plug
8		

2 RPM meter



Figure 6: RPM meter

The RPM meter can be controlled by applying a square wave signal (0V/5V) with a frequency between 50Hz and 600Hz to pin 6 of the 16 pin dashboard connector.

The tabel below gives the measured values.

RPM (1/min)	Frequency (Hz)
250	55
500	116
750	176
1000	234
1250	294
1500	356
1750	416
2000	476
2250	533
2500	596

There is a linear correlation between RPM and frequency given by the formula:

$$y = 0.24x - 4$$

Where y is frequency in Hz and x is RPM

This formula can be simplified to:

$$\text{frequency} = \text{RPM} / 4$$

or

$$\text{RPM} = 4 \times \text{frequency}.$$

3 Fuel gauge



Figure 7: Fuel gauge

The fuel gauge is a mechanical balanced coil type meter. With a simple adapter it can be controlled directly by the EMUS G1 BMS. The inverting jumper needs to be installed.

PDF file

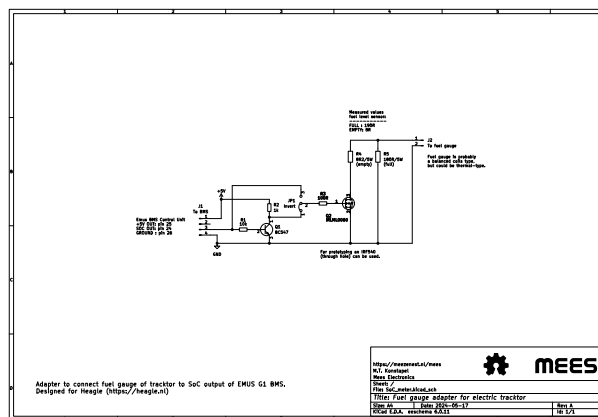


Figure 8: Schematic fuel gauge adapter

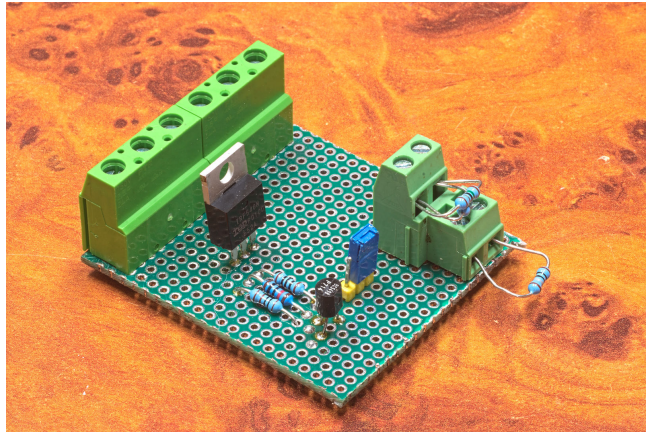


Figure 9: Prototype fuel gauge adapter

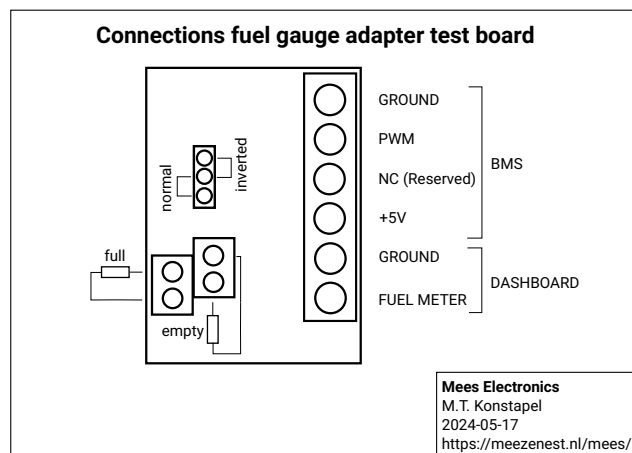


Figure 10: Connection diagram fuel gauge adapter

4 License

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<https://meezenest.nl/mees/>

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4.1 Software

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4.2 Hardware and documentation

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