

Installation instructions tacho board (Mark 2, kit)

Foreword

This is the documentation for the replacement conductor foil for a VW T3 instrument cluster. Like all my projects, this one will be constantly evolving. Therefore, deviations of the technical status from the documentation may occur.

Disclaimer

Assembly and installation should only be carried out by competent persons. As this is a kit, any responsibility for damage caused by or as a result of installation is disclaimed. Only the person who assembles the kit or installs the finished product is responsible for the correct function. The documentation must be observed during use and installation. The operation is intended for a vehicle in series condition (delivery condition).

ATTENTION!!!

Read this documentation carefully and completely. Failure to do so may result in damage to the circuit board and/or vehicle.

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Package contents

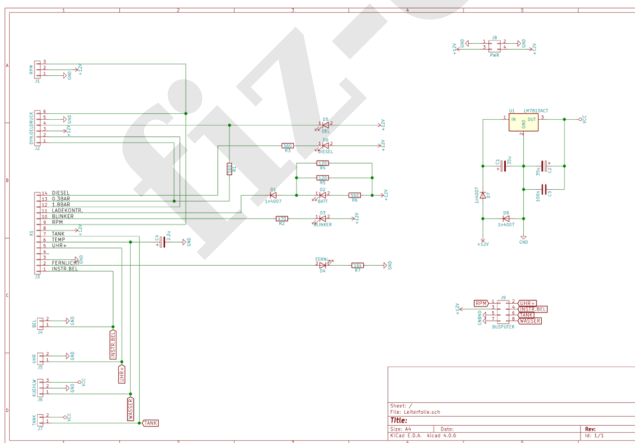
Since there are different compositions of the sets, each set comes with a matching packing list.

Please check the package contents with the packing list. If parts are missing or too few, please let us know. These parts will of course be delivered later.

ABS parts from the 3D printer

All plastic parts were made from ABS with the help of a 3D printer. ABS has an enormous advantage in that the parts remain stable even at higher temperatures. However, ABS has the disadvantage that it shrinks somewhat during processing. This disadvantage was taken into account during production. Therefore it can be technically conditioned that the parts must be partly again reworked (breaking out of supports or removing edges). Now and then it also happens that during printing the corners are a little rounded or the component is not completely flat. However, this does not affect the function.

Circuit diagram



Assembling the board

In the first step the board has to be soldered and even though the board is assembled by machine, a few components still have to be assembled manually.

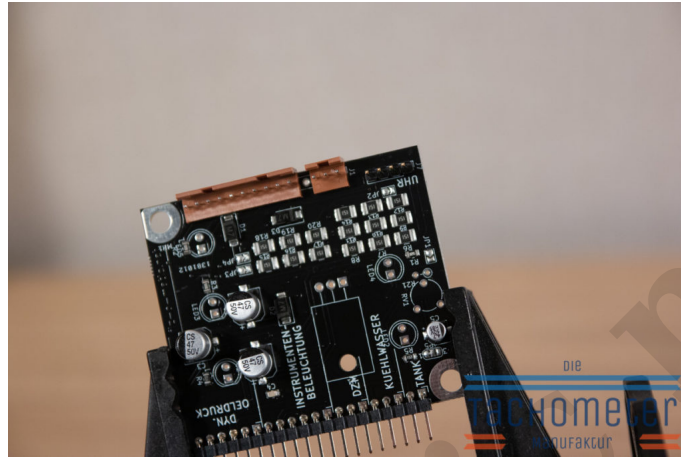
Pin assignments

All connectors have a mark on pin 1, on the board this is a solder pad which is square. All the others are round.

The Dupont connectors also have a marking on pin1.

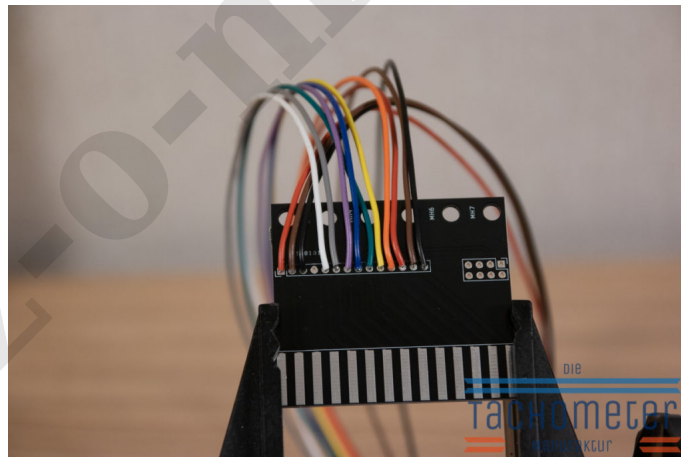
Connectors

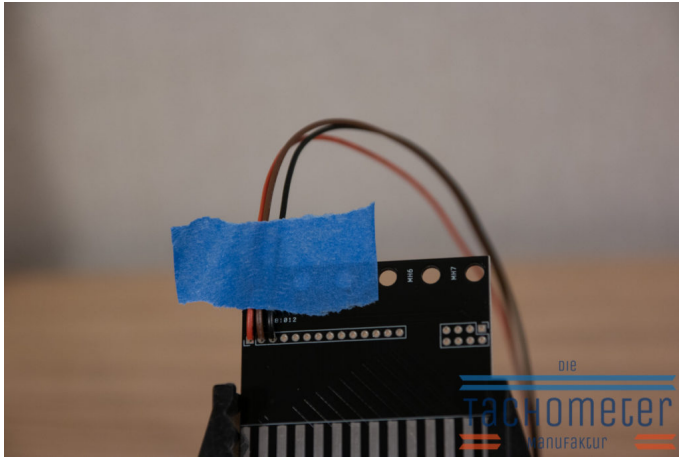
On the upper side of the board goes the angled connector strip and on the lower end go the connectors of the 3-pole and 8-pole cable. Please note that the connection is designed for a 14-pin plug. Unfortunately there is currently no suitable plug or cable available. The 3 pin connector goes on pin 1-3, pin 4 remains free and the 8 pin connector goes on pin 5-14. Next to it the 4 pin connector for the clock is mounted.



Adapter T3 KI connector and new board

As the new conductor foil is simply plugged onto the instrument cluster, a separate adapter is required. This has its own housing which should protect against short circuits. Exactly as described above, the cables are soldered onto this adapter. Pin 1 is marked on the board. Otherwise the assignment is 1:1 to the new conductor foil.

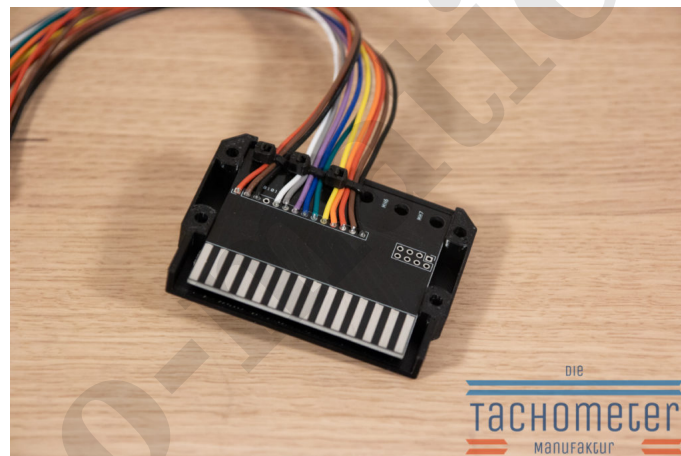




Tip:

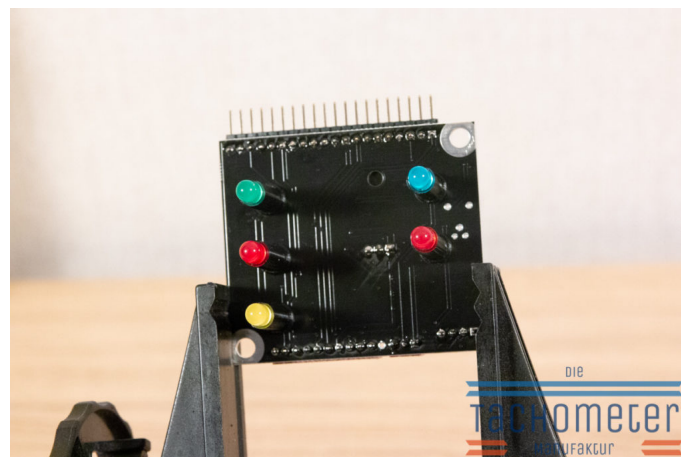
So that the cables do not always slip out during soldering, simply fix them with some adhesive tape.

With a few cable ties for strain relief, the adapter is then ferit assembled.



The LEDs

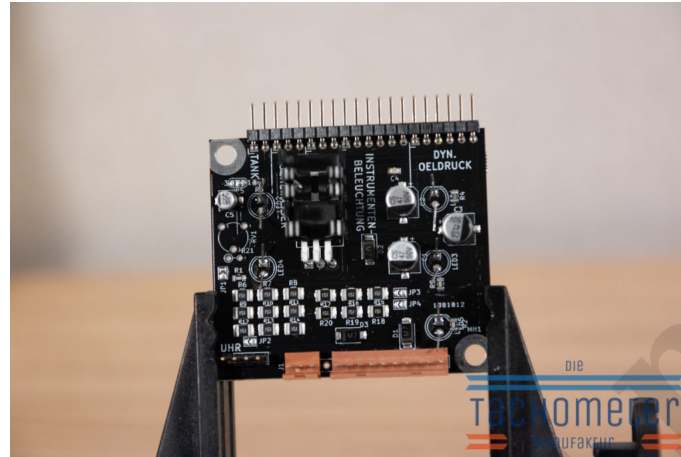
The LEDs are first inserted through the corresponding spacer and then soldered. Here you have to pay attention to the correct polarity. There is a flattened side on the LEDs. This must point upwards (according to the pictogram on the circuit board). In addition, the LED has a short and a long leg. The short leg goes into the square pin on the board.



The voltage regulator

The legs of the fixed voltage regulator are bent to a 90° angle and plugged onto the heat sink.

Afterwards it can be glued and soldered to the PCB with the help of the adhesive pad which is from the backside of the heatsink.



The plug connections in detail

The kit comes with a set of cables with so-called Dupont connectors. These plugs are best suited for this purpose. A connector housing is attached to each of the cables. The connector housings must be partially removed from the cables. Using a small screwdriver or other suitable tool, lift the tab on the connector and then pull out the cable.

Plug adapter

The DZM and the dyn. Oil pressure controls have a somewhat atypical pin spacing for the connectors. Appropriate adapters have been developed for this purpose. The plugs from the cable only have to be pressed into the adapter. Make sure that the plugs are properly seated, otherwise the pins could be bent when plugged in.

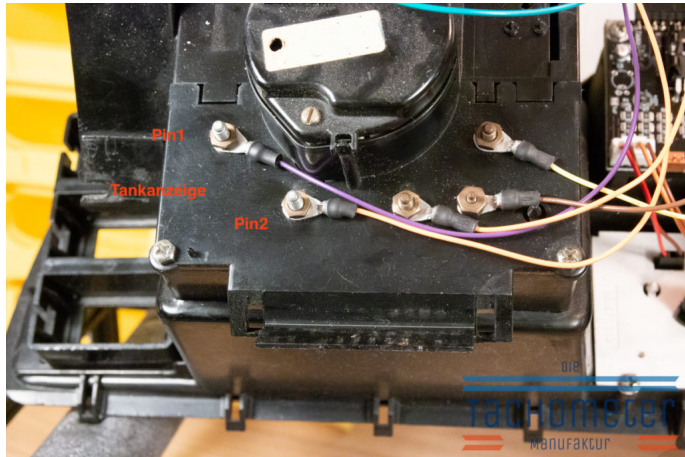
Fuel gauge

On the fuel gauge, pin 1 is on the left side when viewed from the rear. The cable is crimped with two large ring shoes and screwed to the contact threads of the display.



Pin	Cable colour	Function
1	purple	Signal from tank sensor

2	orange	10V
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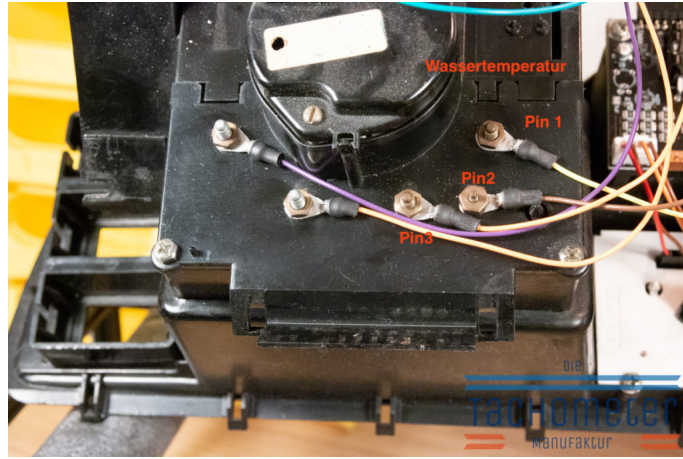
Coolant gauge

The cable for the coolant gauge has a large eyelet (ring shoe) on pin 1 and pin 3 and the small eyelet in the middle on pin 2.

Depending on the variant of the instrument cluster, the display is located at the top or bottom. For instrument clusters without digital clock or with analog clock, pin 1 is on the left side. If the display is on the lower half, then pin 1 is on the right side. Special attention must be paid to this during installation, otherwise malfunctions may occur.



Pin	Color	Function
1	yellow	to the temperature sensor
2	brown	Mass
3	orange	10V



Rev counter

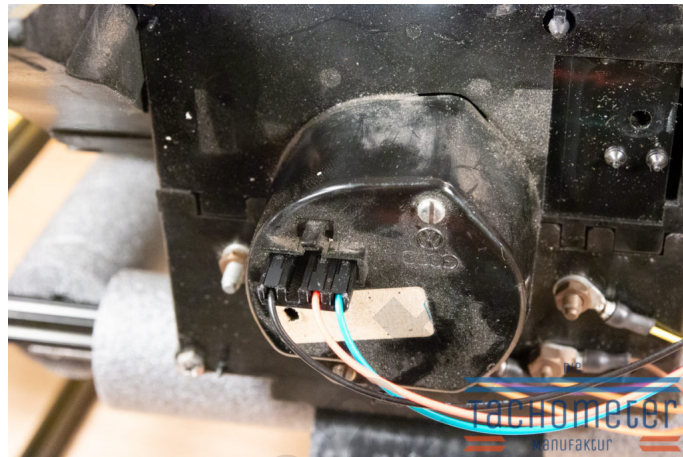
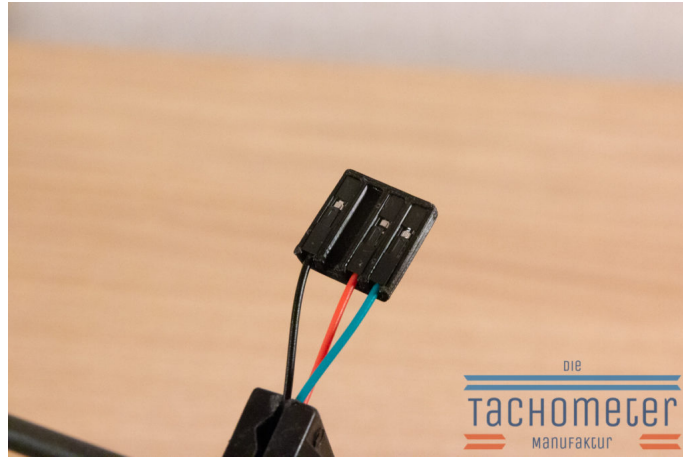
There is a 3 pin connector on the circuit board and the tachometer (DZM) has a 4 pin connector. However, one of the pins is not connected.

The following assignment applies to all petrol engines:

Pin (board)	Pin (DZM)	Color	Function
1	1	black	Mass
2	3	red	12V
3	4	green	Speed signal

There are two different assignments for diesel. Some diesel DZM are connected in the same way as the petrol engines. For other diesel DZMs there is the following assignment:

Pin (board)	Pin (DZM)	Color	Function
1	1	green	Speed signal
2	3	black	Mass
3	4	red	+12V



Dynamic oil pressure control

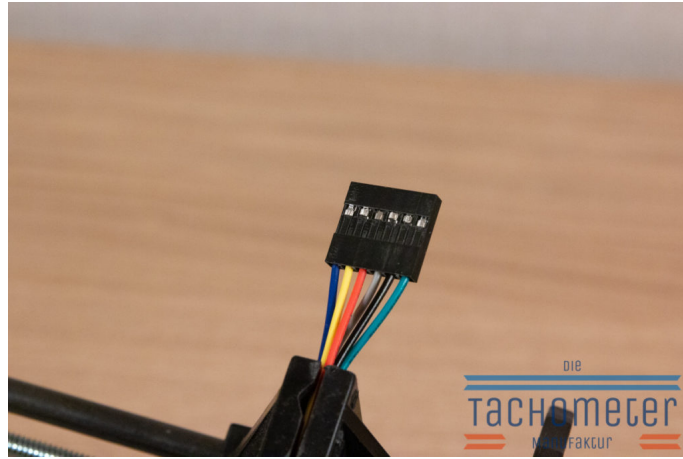
The dynamic oil pressure control compares different parameters. Whereas in earlier versions only the minimum oil pressure is controlled, the dynamic oil pressure control can also evaluate the oil pressure at 2000 rpm.

As soon as you turn on the ignition, the oil pressure LED flashes if you have installed a dynamic oil pressure control. If the LED just lights up, you don't have dynamic oil pressure control.

If the LED does not flash or light up, you can check if you have a connector on the back of the tachometer.

In the case of combination instruments with a dynamic oil pressure control, this must of course also be connected. The circuit board of the dynamic oil pressure control is located on the top of the speedometer housing. It is a 9-pin connector where two pins of the connector are not used. In the further description the pins are simply not counted for simplification.

Pin (board)	Pin (oil pressure control)	Color	Function
1	2	blue	0.3 bar sensor
2	3	yellow	1.8 bar sensor
3	6	red	12V
4	7	grey	LED
5	8	black	Mass
6	9	green	Speed signal



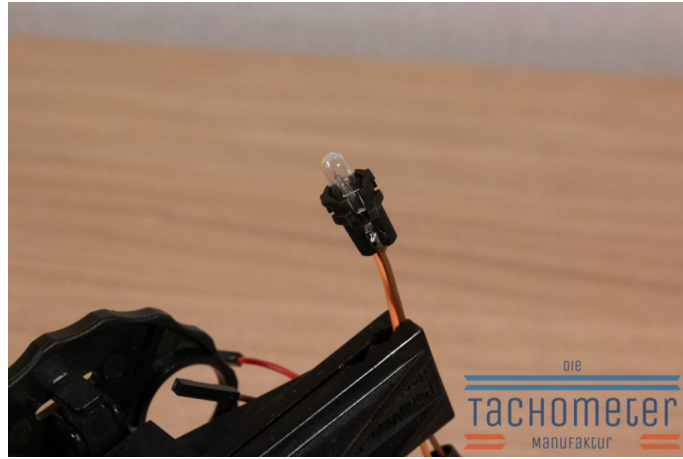
Static oil pressure control

If there is **no** dynamic oil pressure control, JP1 must be closed. Otherwise the oil pressure control will not work.



Instrument lighting

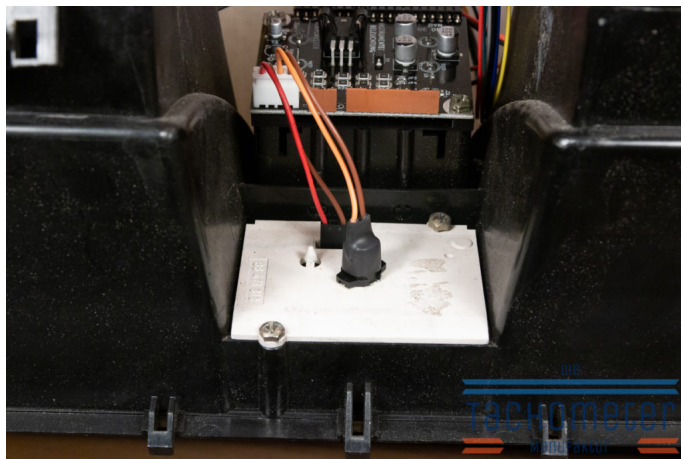
For the upper illumination a 6 pin connector is provided on the board. One pair each is soldered to one bulb. Soldering requires some skill, as the wires are somewhat reluctant to be soldered to the bulbs. Alternatively, LEDs can also be installed. For the bulb in the digital clock there are separate pins on the board to the connector for the clock. Since the bulbs of the instrument lighting last practically forever, one can solder the cables after m.E. of the simplicity confidently directly to the bulbs. In addition, they can then be secured with a little heat shrink tubing if necessary.



Watch

The clock (digital or analog) has a separate connector at the bottom corner of the board.

Pin	Function
1	+12V Clock
2	Mass clock
3	+12V Lighting
4	Mass lighting



Excitation current for the alternator (JP2, JP3, JP4)

In the VW T3 there were different conductor foils with different series resistors for the excitation current of the light engine. On the board these different variants can be realized by solder bridges.

The jumpers JP2, JP3 and JP4 are for this purpose.

If all jumpers are open, the series resistor has a value of 150Ω.

If a jumper is closed, then it is 100Ω.

With two jumpers closed, it is 75Ω.

And if all are closed then it is 60Ω.

(Optional) Adjustable brightness of high beam control (JP5)

The blue LED has a very high luminosity by itself. This can therefore also be blinding or disturbing at night. Therefore the LED was dimmed down so far that it has the brightness of the original. If this is too dark or too bright, a potentiometer can be installed on the board and the brightness can be adjusted individually.

This requires a horizontal pinher PT6 potentiometer and a 5kΩ resistor. The potentiometer then comes to the position RV1 and below that the resistor. Additionally the jumper JP5 has to be soldered. To do this, the bridge between 1 and 2 is released and reset to 2 and 3.

Functional test

Before the first ride, everything must be checked for correct function. The following things should be emphasized above all:

- Oil pressure control or dyn. Oil pressure control
- Charge control
- Coolant and low coolant indicator - Turn signal and high beam indicators
- Fuel gauge
- Diesel preheating LED

fiz-o-matic

There is a separate connection for the fiz-o-matic. Depending on the component used and the configuration of the **fiz-o-matic**, the cable must be adapted according to the assignment. A 1-to-1 pin assignment is not given.

Closing words

Finally, I wish you success and a lot of fun during assembly and always an accident-free and mishap-free ride.