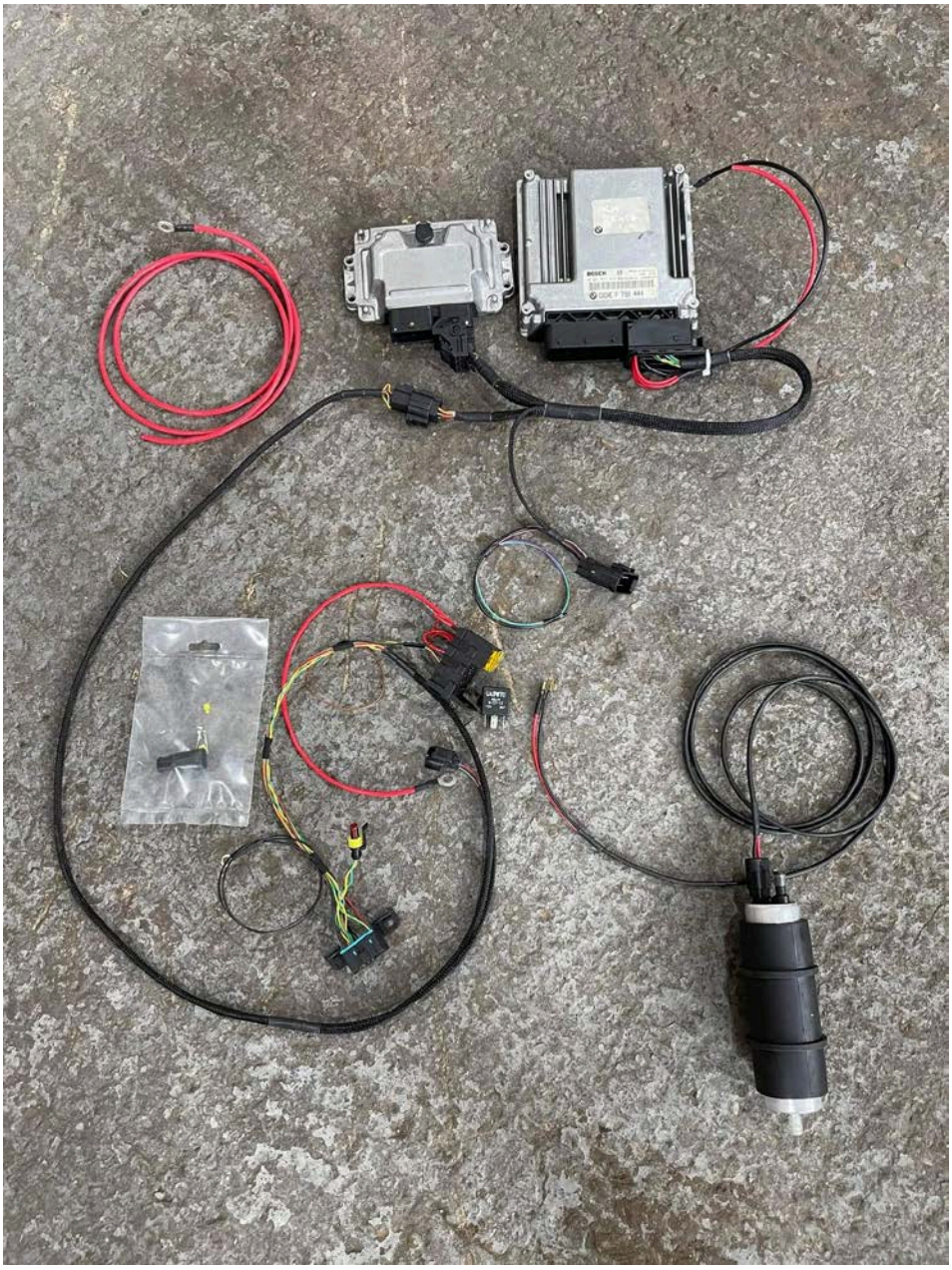
Defender 2.4 Dashboard Control Module Instructions



FLATCAP ENGINEERING

Contents

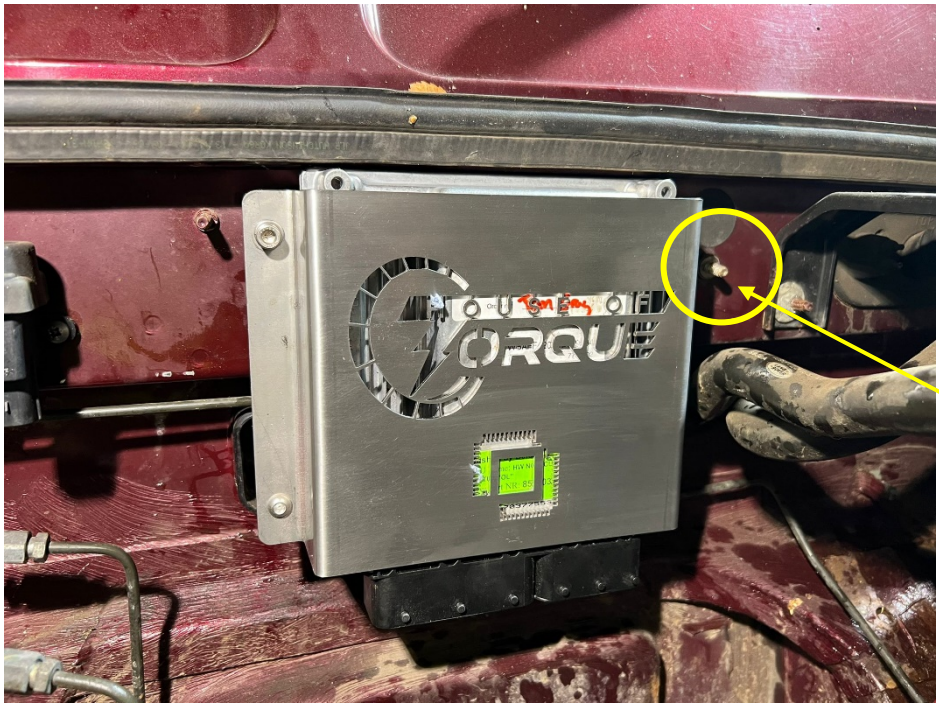
Bulkhead Harness

The controller harness is comprised of 2 parts; the bulkhead harness, and the seatbox harness. They are joined by a 10 way connector. The bulkhead harness connects to the dashboard control module, and BMW ECU. There is also a 14 way connector on this harness with tails; this connects to the original Land Rover harness located in the engine bay, and contains connections for:

- Starter Motor (Black)
- AC Pump +12v (Blue/Red)
- AC Pump GND (Red/Black)

To install the dashboard control module & harness, first remove the original 2.4 ECU and its mounting bracket. You will need to remove the AC pipework from the bulkhead in order to remove this bracket. This will provide ample space for the ECU and Dashboard Control module to be mounted.

Mount the ECU and Controller on the bulkhead behind the engine. Mark and drill the holes, and use suitable fasteners such as rivnuts. A House of Torque ECU cradle aids installation of the ECU.



The bulkhead harness also includes the ECU main power and ground connections. This is a red and brown tail, which exits the ECU connector. The brown cable has a ring connector installed, which needs to be connected to a suitable ground source. The Defender bulkhead has a suitable ground connection, shown in the picture above. Ensure it is free from rust and dirt. Follow instructions on the following page for ECU power connection.

ECU Power Connection

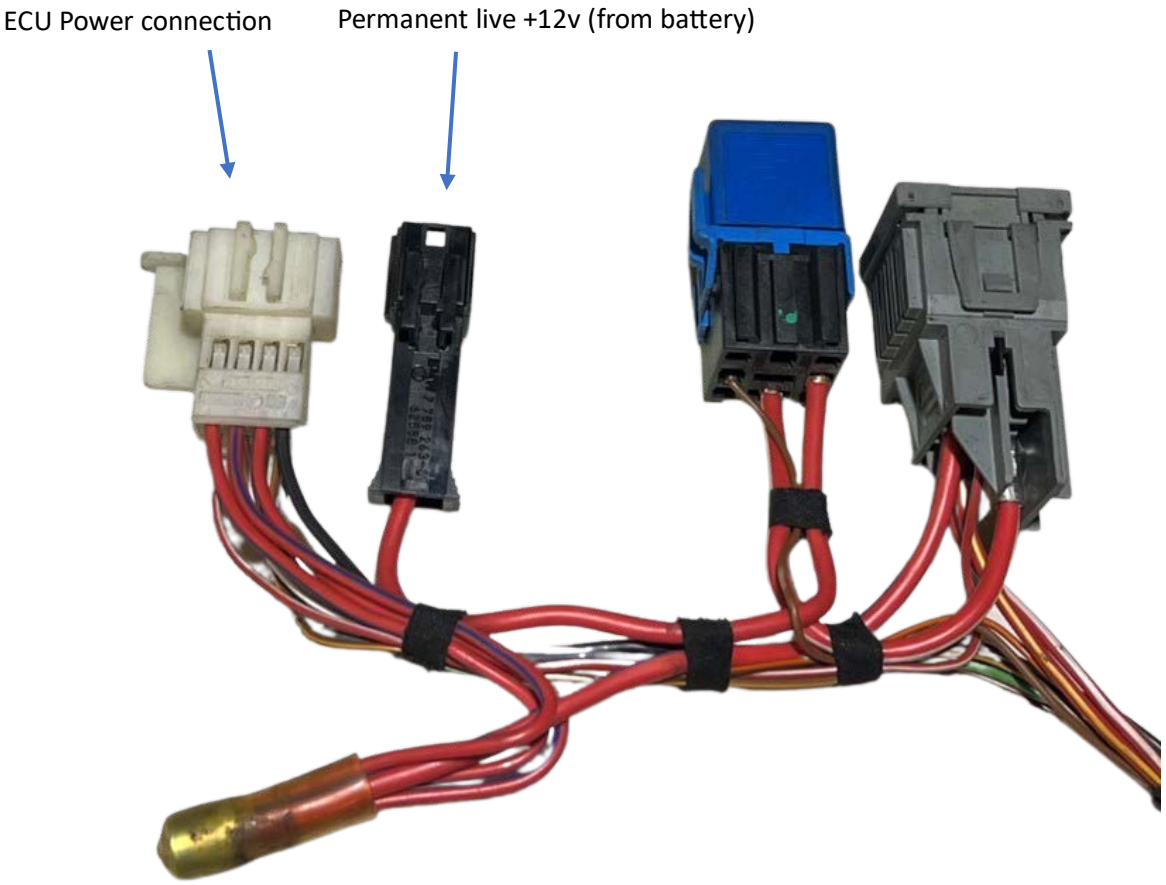
The ECU receives its power from the blue relay in the engine harness. This is known as the DDE main relay, and is activated by the ECU. 2 connections need to be made to the engine harness for power:

- Permanent live (red)
- Power feed to ECU (red/blue)

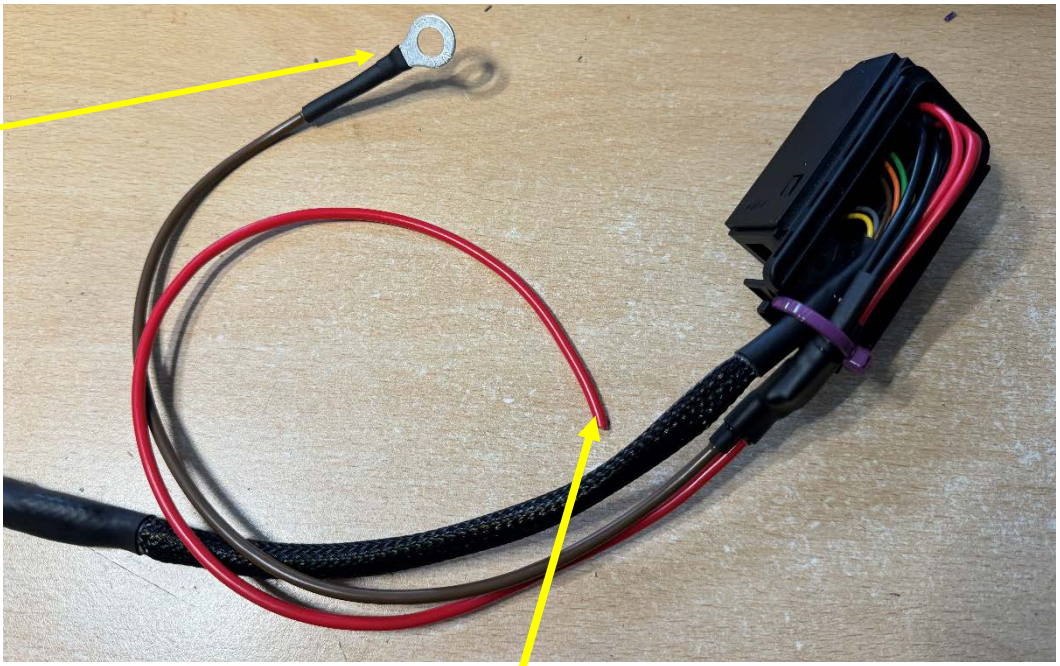
A suitable length of 6.0mm2 red cable is supplied to connect the ECU permanent live feed. This should be connected directly to the battery using the ring terminal provided. If you connect to the back of the starter motor or any other location, you run the risk of voltage drops and spikes that may affect the operation of the ECU.

Connect the short red tail from the ECU connector to the red/blue wire exiting the engine harness.

Please be aware that we do not supply any “plug and play” means of connecting to the engine harness, as there are a few different variations.



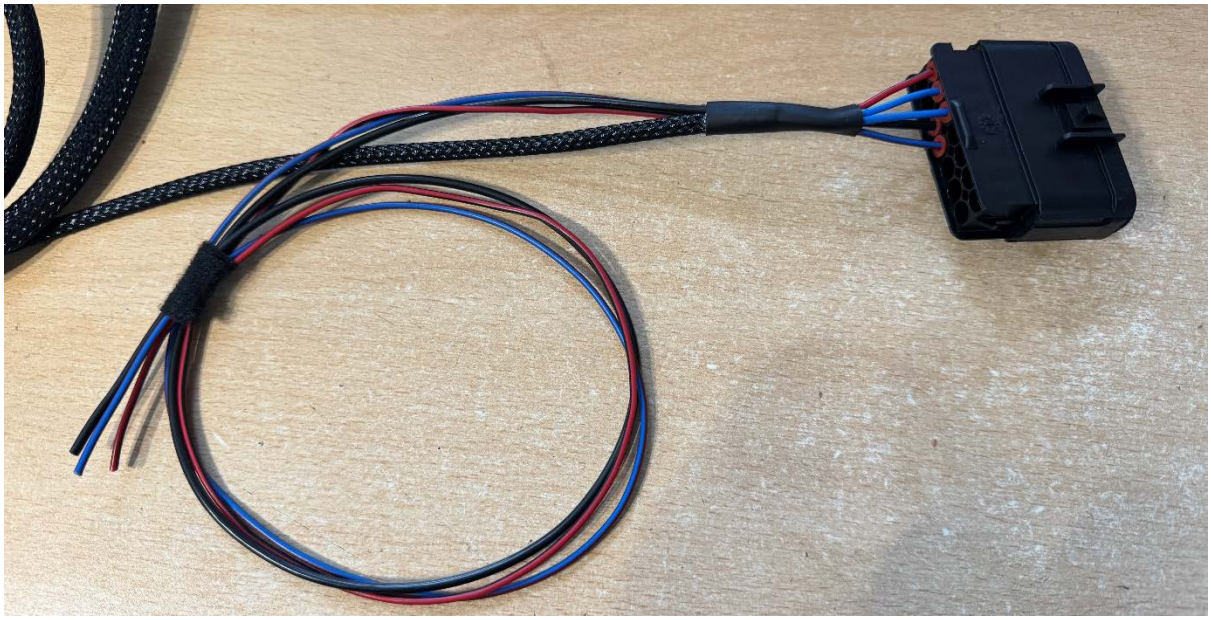
Ground



Connect to red/blue exiting engine harness from DDE relay

Follow instructions on the next page for connecting the starter motor, and AC (if fitted)

Other Connections



The 14 way connector on the bulkhead harness connects to the Land Rover harness, in the engine bay. This connector is responsible for the starter motor solenoid output, AC (if fitted), and the reverse light (pre wired).

- Starter motor (black)
- AC Pump +12v (purple/yellow)
- AC Pump GND (red/black)

Connect the supplied tails to your engine harness. The BMW starter motor wire should be quite easy to identify, also being a thick black wire of similar size to the one supplied. AC pump wiring colours vary from engine to engine, so it is best to consult a diagram for your particular engine to assist with this.

Make sure all connections are of high quality, soldered or crimped with insulated/sealed connections. Ensure all wiring is tied securely so that it is not at risk of becoming damaged or worn through.

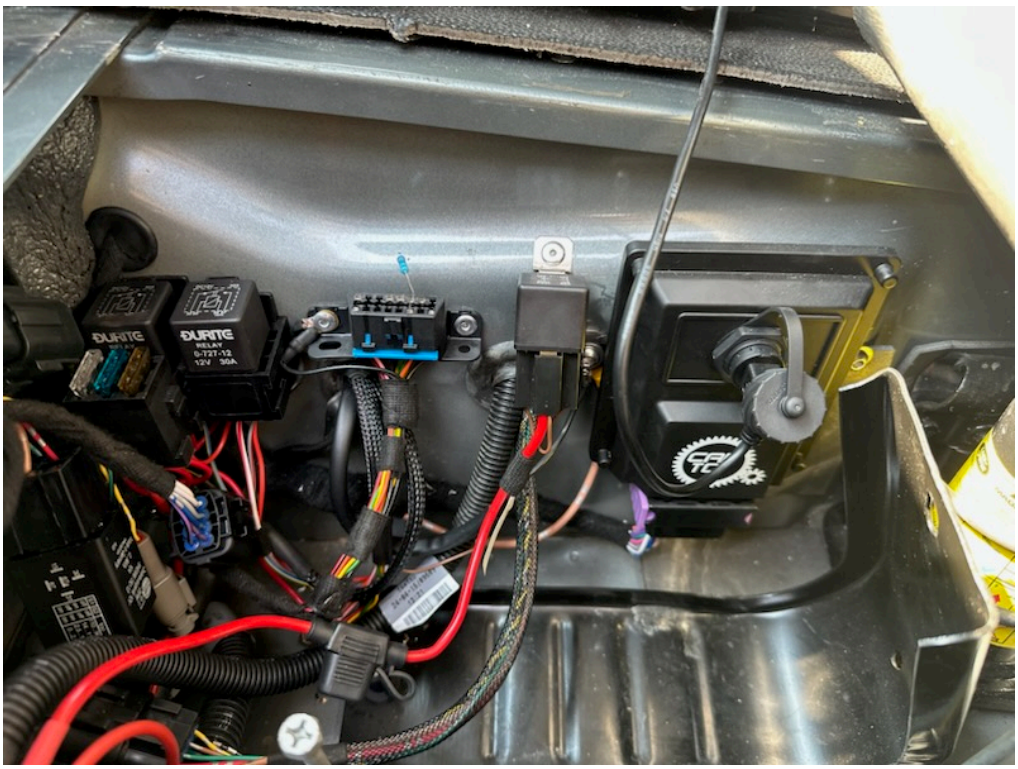
Seatbox Harness

The seatbox harness contains relays for the fuel pump, and reverse light (auto). The harness also includes the facility to install your own wiring for an electric fan. It also contains the OBD port for diagnostics.

The seatbox harness should be fed through from the battery box, through a grommet, and up into the engine bay. The 10 way connector should be connected to the bulkhead harness.

Mount the relays and OBD port in a suitable location in the battery box. Connect the red supply cable to the battery with the ring terminal.

The large red cable with ring terminal is the supply for the fuel pump, and automatic gearbox (if fitted). It should be connected directly to the battery positive terminal.



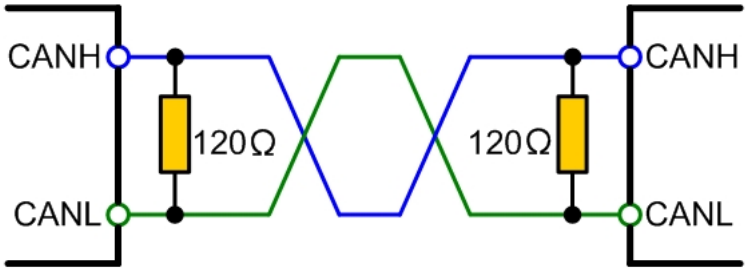
A typical installation, also including a CANTCU for 8HP gearbox integration

The supplied fuel pump cable is designed for the connection of an inline BMW fuel pump. There is ample length on this cable for most installations, however if you need a longer cable please contact us and we can assist. Once the fuel pump is mounted, connect the 2 pin connector, and route the cable back to the battery box. On the other end of the fuel pump cable is a ring terminal and a faston spade terminal. Remove the fuel pump relay (the relay in the same block as the fuses), and insert the faston spade from below until it positively clicks into place. Reinstall the relay. Choose a suitable ground point for the fuel pump that is free of dirt, paint and rust, and secure the ring terminal.

CANBUS Connection

All of the CANbus connections to the ECU, and Dash Control module are handled in the loom.

We have taken extra care to ensure that the resistance of the CANbus network is correct. However, if you are experiencing issues, it is always worth checking the resistance. CANbus network resistance should be 60 ohms. Spaces are provided in the harness and/or gearbox harness for plug in resistors to negate the need for soldering in external components.



1. Resistance is too low (<60 ohms):
    a. You have too many resistors in the network. Remove the plug in resistor provided.
2. Resistance is too high(>60 ohms):
    a. You do not have enough resistors. Add 1 resistor, and re measure.
3. I have added more than 1 resistor, but the resistance is still not right?
    a. Verify you are checking the resistance from the correct point. Use the pictures below as an aid.
    b. Check that the 10 way connector between the seatbox harness and bulkhead harness is securely connected.
    c. Ensure the ECU, and Dash Control module are connected.
    d. Ensure the car is powered OFF. Wait for the DDE relay to de energise (up to 2 minutes). Re measure.

Automatic Gearbox Connection & Radiator Fan

The harness is designed to connect to House of Torque gearbox looms. This ensures that all the wiring required is plug and play.

https://house-of-torque.com/product/zf6-standalone-wiring-harness/

https://house-of-torque.com/product/cantcu-zf8-standalone-wiring-harness/

Each of these looms require 2 connections to the dash controller harness; CANbus, and power. 2 connectors are provided near the relays in the seatbox harness. They are different for both 6HP and 8HP.

Radiator Fan

Provision is included for controlling an electric radiator fan. A brown wire exits the harness next to the relays. This is a **negative** trigger for activating a relay. It turns the fan **ON** at 96 degrees, and **OFF** at 92. It will need to be connected to your own relay for the fan that is suitably sized for the fan that you intend to use. We advise to use the largest fan possible, and the highest wattage for the most effective cooling, especially when working the engine hard, or in hot climates. You can use the fan control wired up as below: