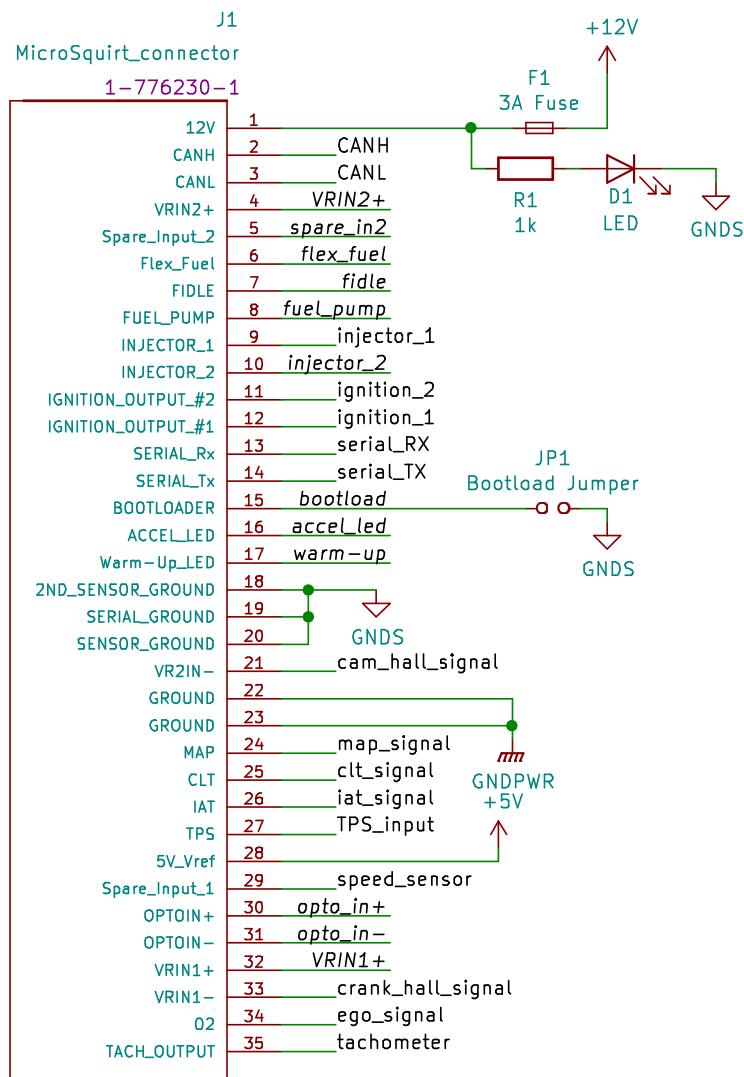


MicroSquirt

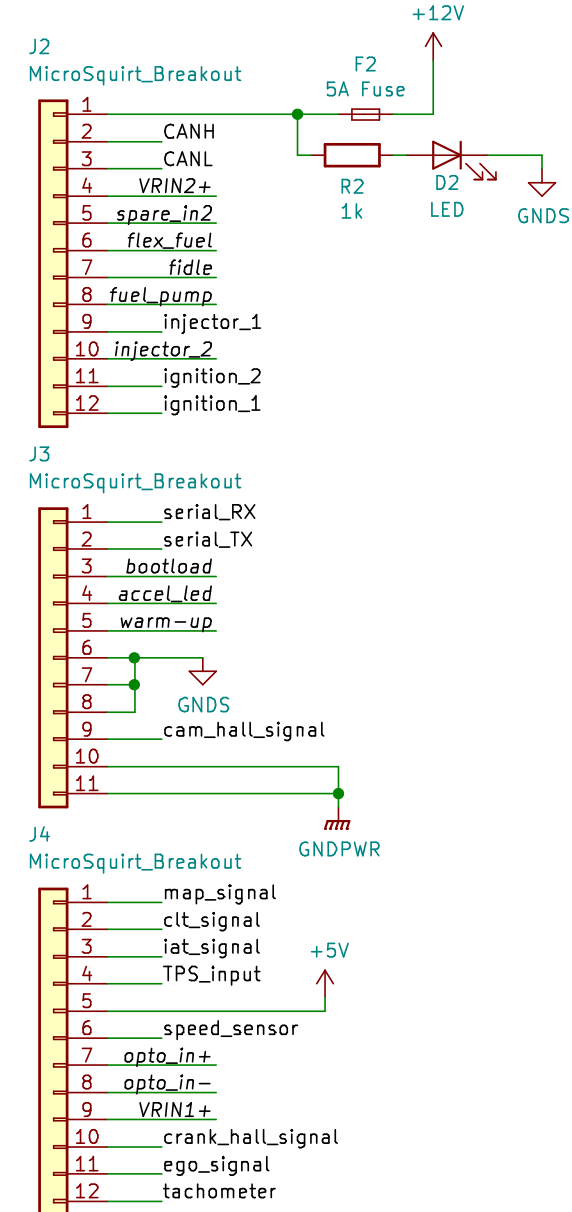
Connector to the MicroSquirt ECU. The Bootload jumper is to allow flashing new firmware. The connector must be wired with the same pinout as the MicroSquirt.

The left oriented labels in italic are not actually used, but only utilized to rout the breakout connector.



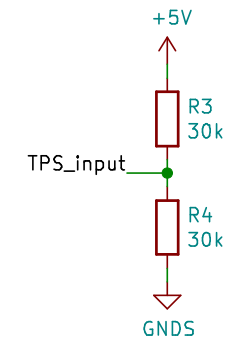
MicroSquirt Breakout

All pins of the Microsquirt are broken out to more easily accessible connectors to allow for future modifications. Fuse dimension should be adjusted according to expected load.



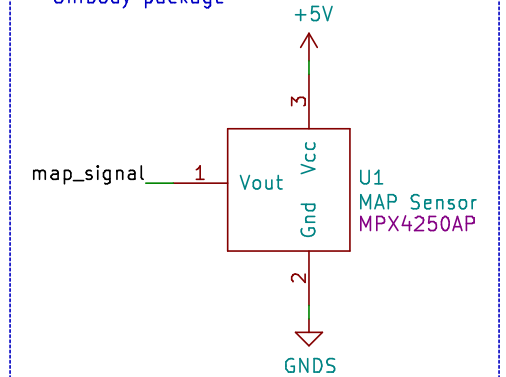
TPS

As Vera does not have a throttle the throttle position sensor input is given a constant input.

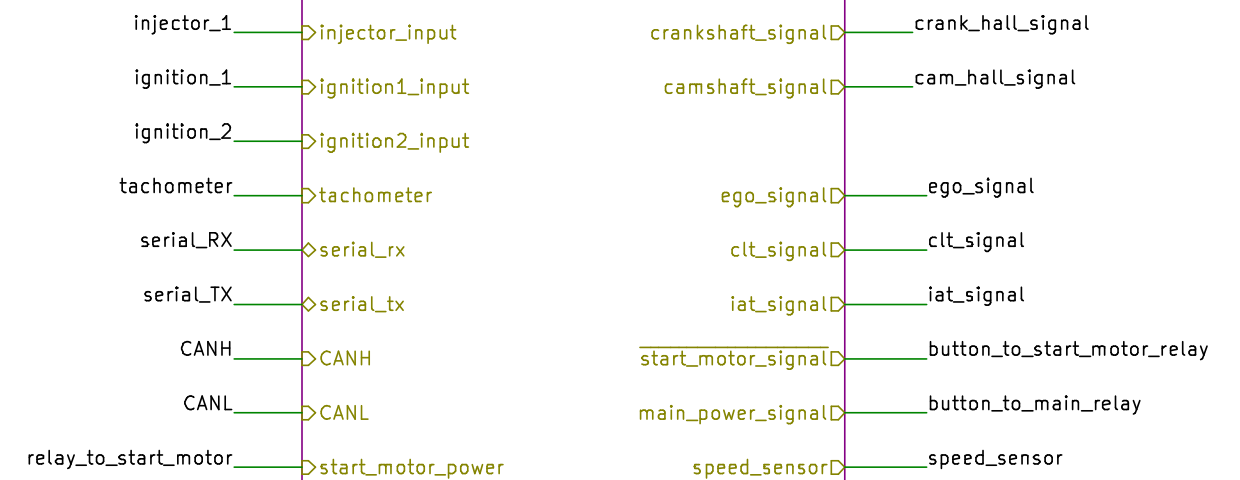


MAP sensor

MAP Sensor Model: NXP MPX4250AP Unibody package

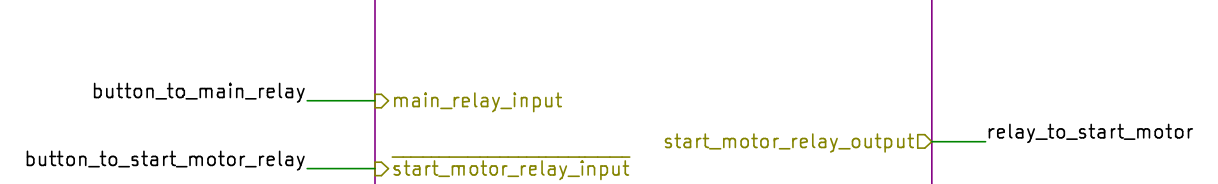


Sheet: Connectors



File: connectors.sch

Sheet: Relays



File: relays.sch

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Chalmers Vera Team

Sheet: /

File: ecu-board.sch

Title: Vera ECU Board

Size: A4

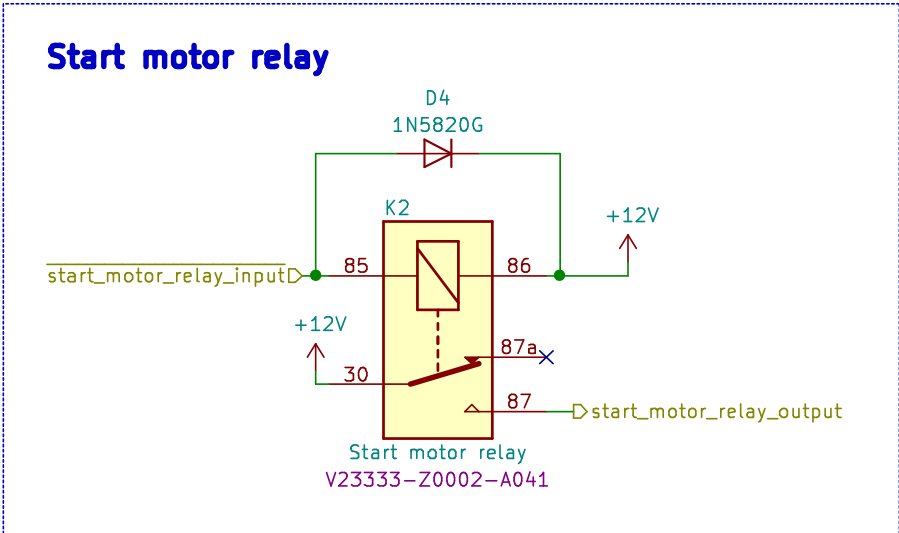
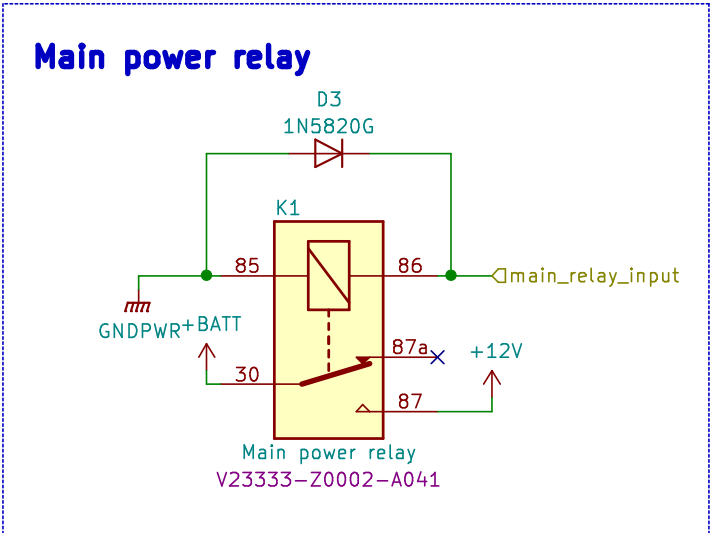
Date: 2019-10-12

Rev: 0.1

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Id: 1/3

Both relays are of type ISO Mini (aka ordinary automotive relay) and must be rated for at least 40 A.



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Sheet: /Relays/

File: relays.sch

Title: Vera ECU Board

Size: A4

Date: 2019-10-12

Rev: 0.1

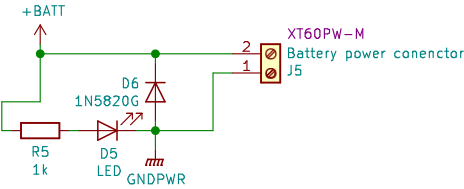
KiCad E.D.A. kicad 5.1.4

Id: 2/3

Battery

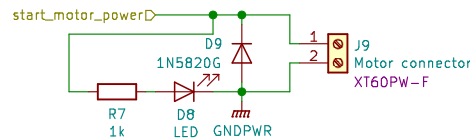
Battery power is only connected to the main power relay, as well as the normally open bistable power switch controlling said relay.

The battery input must be protected by an external fuse.



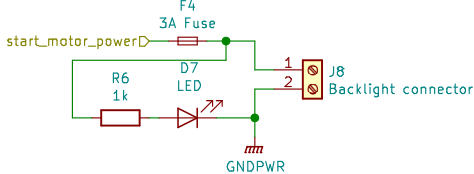
Start motor

The start motor power is switched by a normally open monostable switch. The motor should be protected by a 50A in-line fuse.



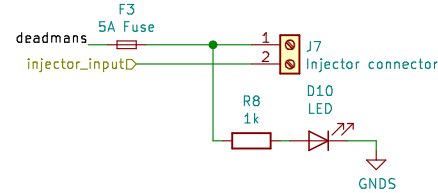
Backlight

The backlight is lit at all times the start motor is powered.



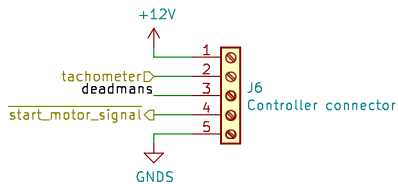
Injector

Injector input is switched by a normally open dead man's switch.



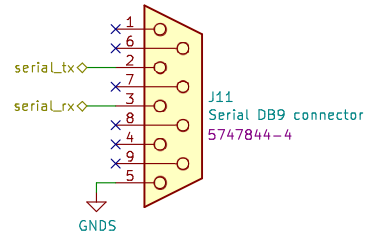
Start motor controller

Interface to a separate circuit which handles timing of start motor depending on engine RPM. The start motor is activated by pulling start_motor_signal low.

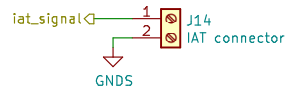


RS232 Serial Port

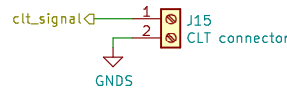
DB9 serial connector for mapping of MicroSquirt.



Intake Air Temperature

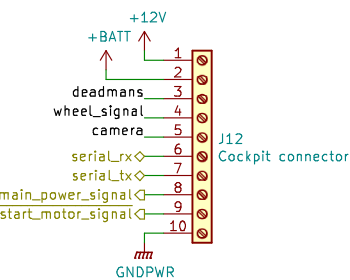


Motor Coolant Temperature



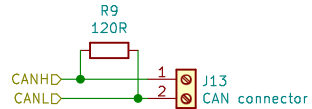
Cockpit connections

Connection to the Raspberry Pi based HMI. Button inputs for relay control of main power, starter motor and dead man's switch to injector.

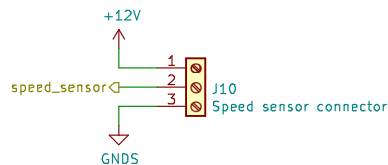


CAN

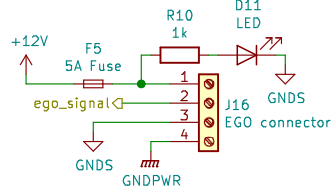
With termination resistor.



Speed sensor input

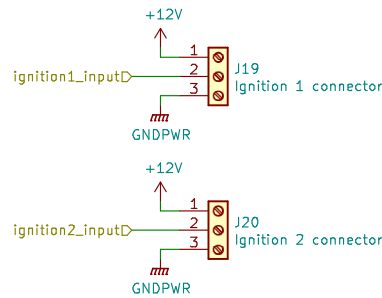


EGO Lambda sensor



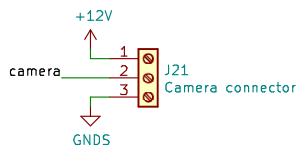
Ignition

The electrical system is designed to function with either one or two ignition coils. Currently it is only using Ignition 1.



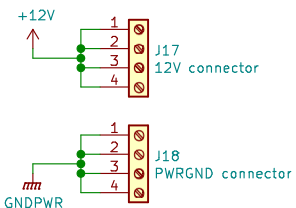
Camera

The back camera is connected by RCA to the LCD display in the cockpit.



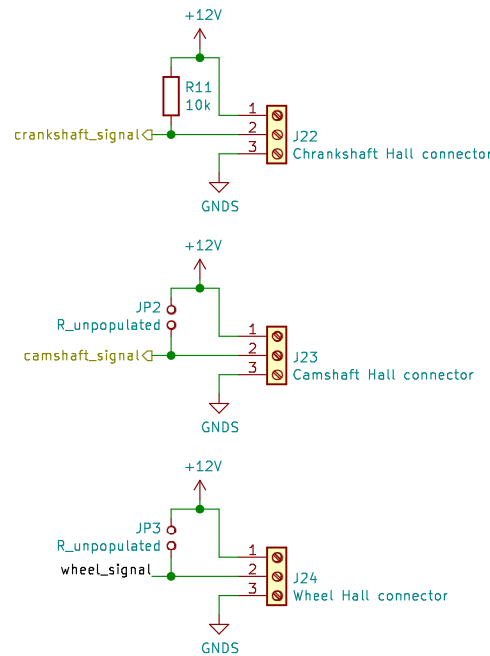
Redundant power output

Extra power outputs for unforeseen expansions or prototyping.



Hall sensors

Hall Sensor Model: Littlefuse 55110-3M-03-A
Crankshaft Sensor: CYKNB-02CL0
Second ground is for potential shielding.
Jumpers enable using other hall sensors.



Designed by Erik Almbratt (erik.almbratt@gmail.com)

Chalmers Vera Team

Sheet: /Connectors/

File: connectors.sch

Title: Vera ECU Board

Size: A3 Date: 2019-10-12

KiCad E.D.A. kicad 5.1.4

Rev: 0.1

Id: 3/3