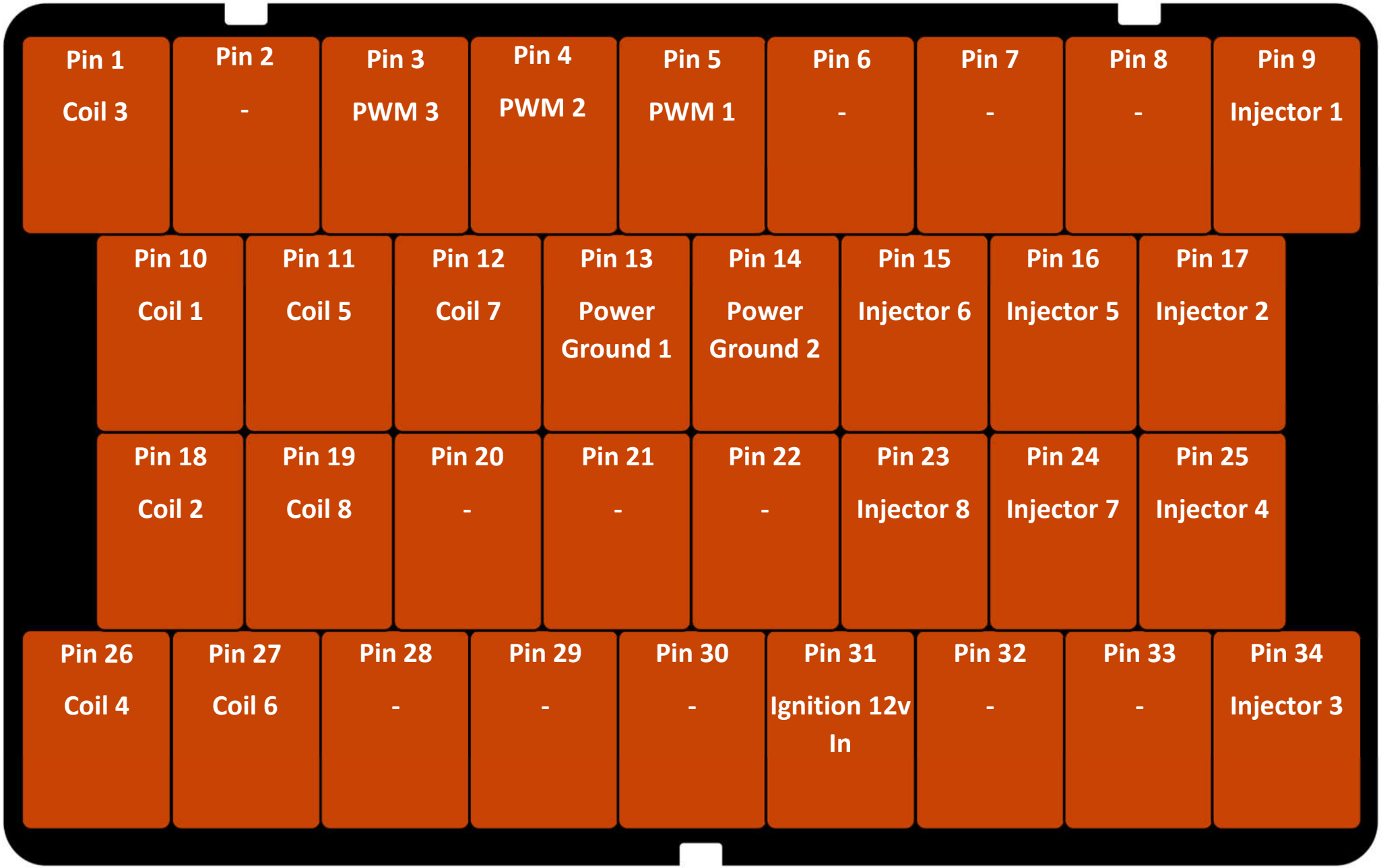
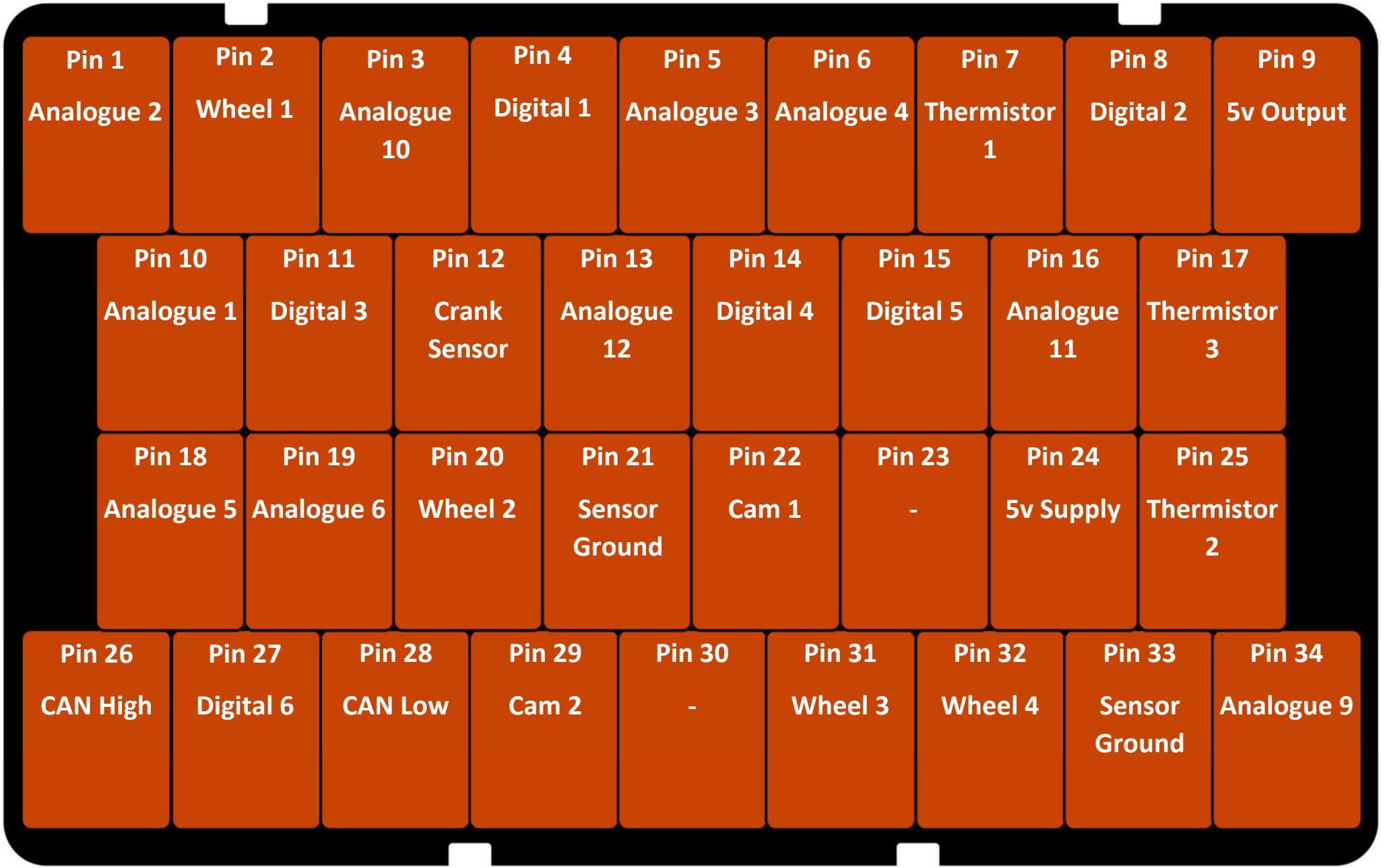
T8 ECU

Pinout Version: 1.03
Pin-Insertion Side
Connector 1



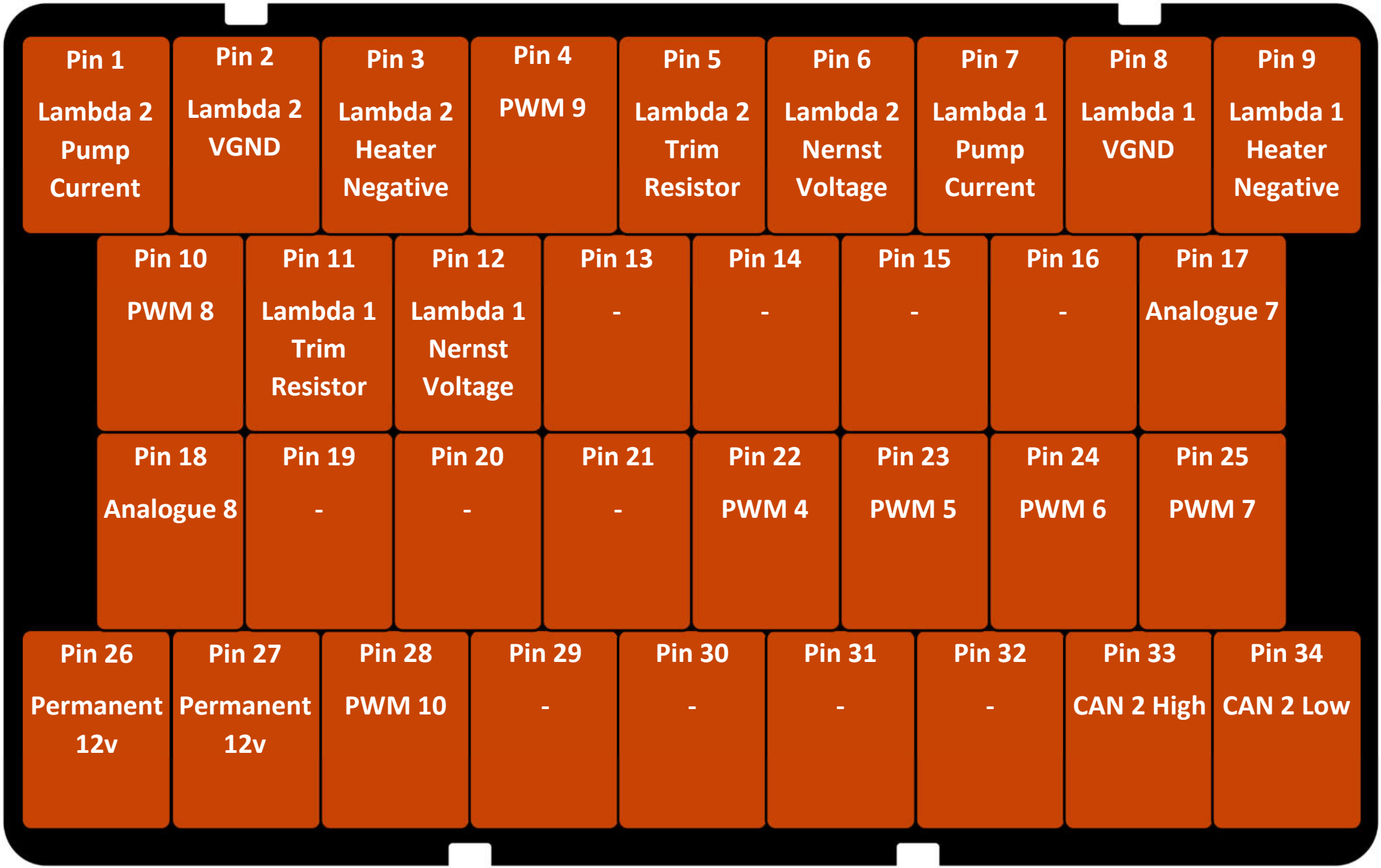
T8 ECU

Pinout Version: 1.03
Pin-Insertion Side
Connector 2

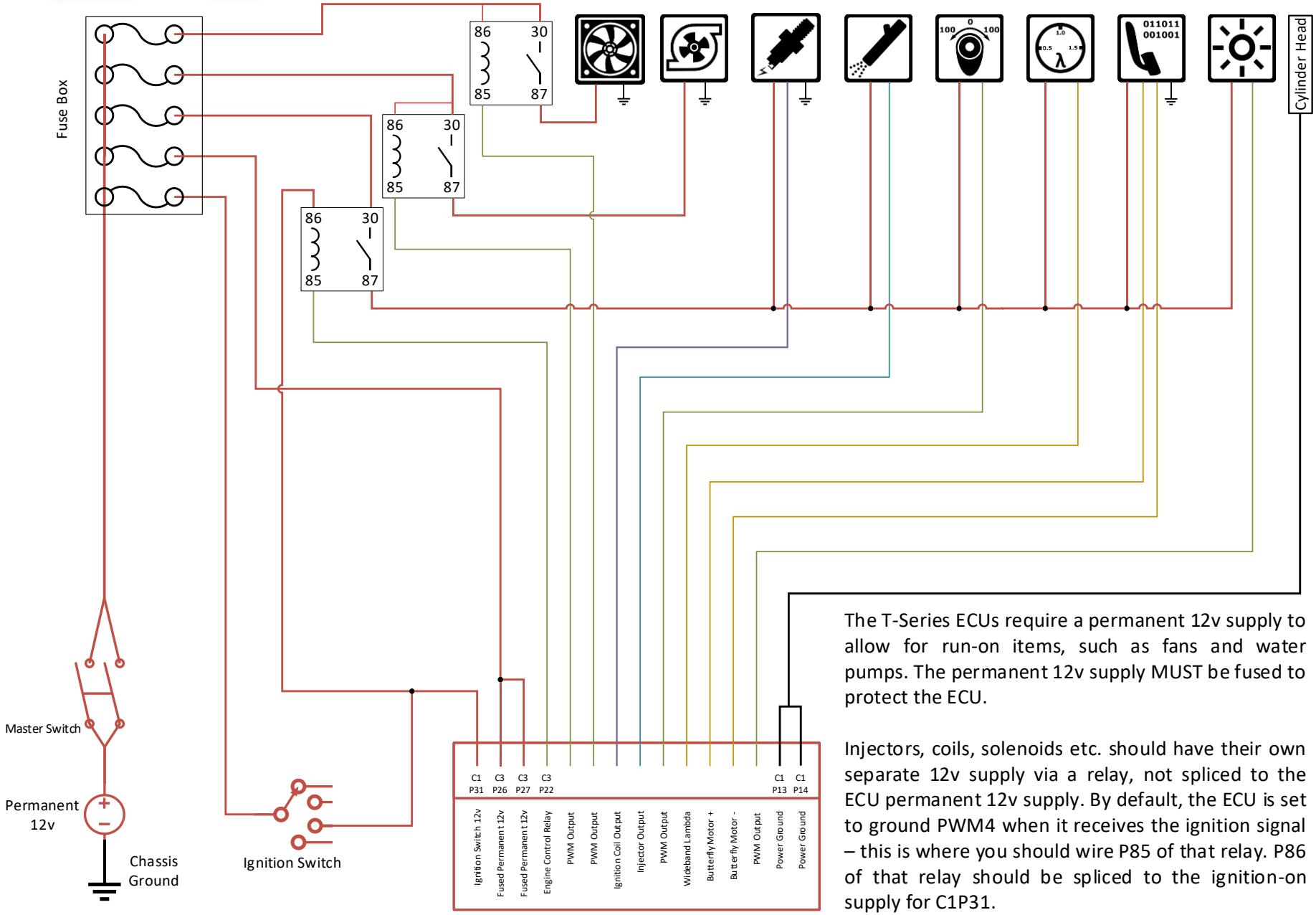


T8 ECU

Pinout Version: 1.03
Pin-Insertion Side
Connector 3



T4-T12 ECU
12v Wiring

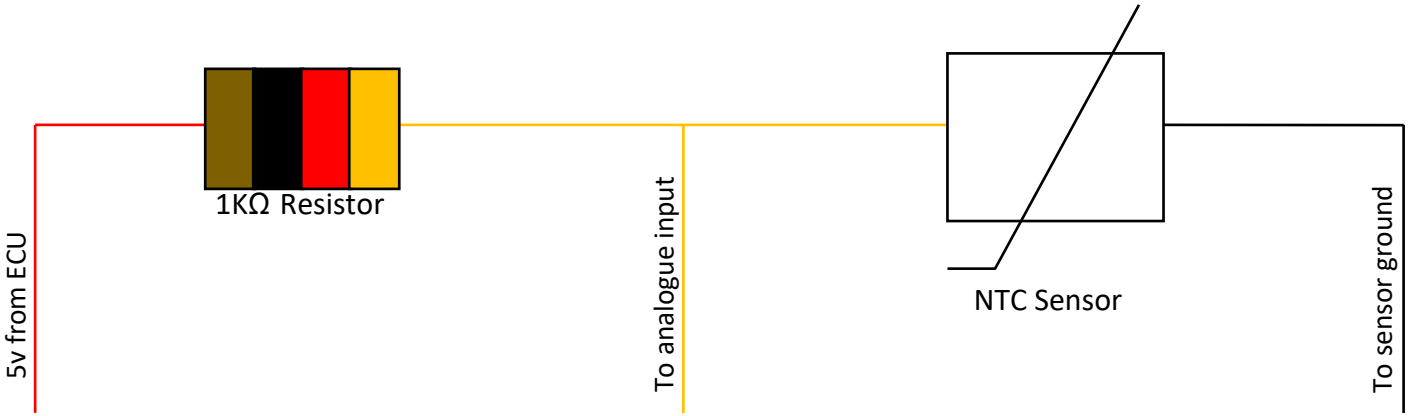


The T-Series ECUs require a permanent 12v supply to allow for run-on items, such as fans and water pumps. The permanent 12v supply MUST be fused to protect the ECU.

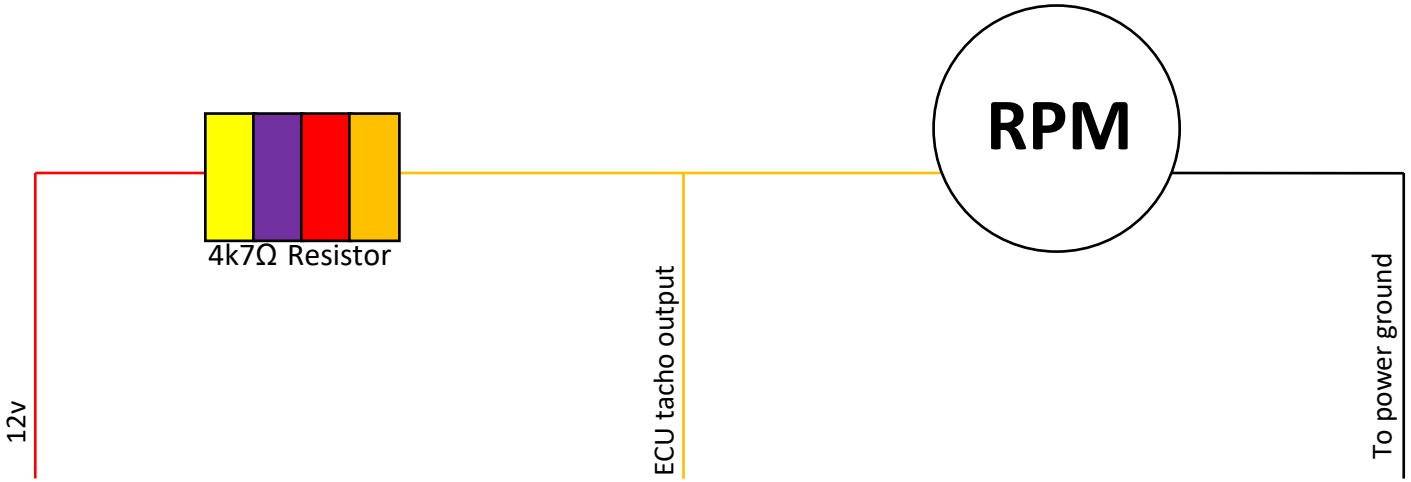
Injectors, coils, solenoids etc. should have their own separate 12v supply via a relay, not spliced to the ECU permanent 12v supply. By default, the ECU is set to ground PWM4 when it receives the ignition signal – this is where you should wire P85 of that relay. P86 of that relay should be spliced to the ignition-on supply for C1P31.

T-Series ECU
Pullup Wiring

You can connect a temperature sensor to an analogue input by using a 1kΩ pullup resistor.



For hardware versions Rev. B and C, some tachometers may require a 4k7Ω pullup resistor to work. Rev. D boards have this built-in.



T-Series

Default Assignments

Analogue Input	
Analogue 1	None
Analogue 2	None
Analogue 3	Oil Pressure
Analogue 4	Fuel Pressure
Analogue 5	None
Analogue 6	None
Analogue 7	None
Analogue 8	None
Analogue 9	Throttle Position Sensor
Analogue 10	Gear Potentiometer
Analogue 11	MAP
Analogue 12	None
Analogue 13	None
Analogue 14	None
Analogue 15	None
Analogue 16	None

Digital Input	
Digital 1	Launch Switch
Digital 2	Traction Switch
Digital 3	Traction Wet/Dry
Digital 4	Shift Cut
Digital 5	Map 2
Digital 6	Aux Switch
Digital 7	None
Digital 8	None
Digital 9	None

NTC Input	
Thermistor 1	Air Temperature
Thermistor 2	Water Temperature
Thermistor 3	Oil Temperature

Wheel Input	
Wheel 1	Left Undriven
Wheel 2	Right Undriven
Wheel 3	Left Driven
Wheel 4	Right Driven

PWM Output	
PWM 1	Camshaft 1
PWM 2	Fan Relay
PWM 3	Fuel Pump Relay
PWM 4	Engine Control Relay
PWM 5	Tacho
PWM 6	Shift Light
PWM 7	VTEC
PWM 8	Turbo Valve
PWM 9	Camshaft 2
PWM 10	None
PWM 11	Camshaft 3
PWM 12	Camshaft 4

For Paddle Shift Only (T8+/T12/T12+)	
Input	**Connector 2 - 4-Keyway (middle)**
Paddle Up	Pin 14 (Digital 4)
Paddle Down	Pin 15 (Digital 5)
Neutral	Pin 27 (Digital 6)
Compressor Pressure Sensor	Pin 1 (Analogue 2)
Output	**Connector 3 - 4-Keyway (end)**
Up Solenoid	Pin 25 (PMW 7)
Down Solenoid	Pin 4 (PMW 9)
Neutral Solenoid	Pin 10 (PMW 8)
Throttle Blipper	Pin 23 (PMW 5)
Compressor Relay	Pin 28 (PWM 10)

For Drive-By-Wire (T4+/T8+/T12+)	
Butterfly Pot 1	Analogue 8
Butterfly Pot 2	Analogue 9
Pedal Pot 1	Analogue 2
Pedal Pot 2	Analogue 1
Motor Positive	Motor +
Motor Negative	Motor -

PLEASE NOTE: BOTH ANALOGUE 1 AND ANALOGUE 2 HAVE SOFTWARE SWITCHABLE PULL-UP RESISTORS. FOR HARDWARE REV.B, THE RESISTANCE IS 4K7, FOR HARDWARE REV.C AND HIGHER, THE RESISTANCE IS 1K. THIS ALLOWS THE USE OF EXTRA TEMPERATURE SENSORS OR PEDALS WHICH REQUIRE PULL-UP RESISTORS

T-Series

Generic Connections

Sensor Grounding

All sensors must be grounded to the ECUs sensor ground to prevent interference from potentially electrically noisy items on the power ground. It is recommended that the "star" method of wiring the grounds be used, i.e. all sensor grounds come back to the ECU connector as far as possible before they are spliced into the ECU connector. This will help prevent ground loops that can cause erroneous sensor readings.

Digital Inputs

Digital inputs, such as launch control buttons or traction switches need to be grounded to sensor ground to activate. One side of the switch/button will go to the input, the other side to sensor ground.

Analogue Inputs

Supply voltage – 5v from ECU

GND – To ECU sensor ground

Signal – To analogue input

The analogue inputs can be used with anything that outputs 0-5v. Resistive sensors, like temperature sensors, can also be wired to the analogue inputs but they must be wired with a pull-up resistor in order to generate a 0-5v signal. The value of this resistor will depend on what you are using. However, if you wish to use a temperature sensor that has a scaling table already in the DTA software, you must use a 1k pull-up as that is what the dedicated NTC inputs use and that is what the scaling will be based on. In most cases, a 1k pull-up will be fine but you should always check that a 1k pull-up will produce a 0-5v output that fully covers the range of your sensor because an incorrect pull-up could lead to a sensor reading 5v to early/late in it's full range. NOTE: Analogue 1 & 2 on the T4 and above have software switchable pull-up resistors. For REV.B, the resistance is 4k7. For REV.C and higher, the resistance is 1k.

Wideband Lambda (LSU 4.9) Sensor

The T-Series ECUs have been designed to support the Bosch LSU 4.9 wideband lambda sensors only. The 12v supply for the sensor is not provided by the ECU and must instead be provided by the vehicle. Current draw is generally no more than 2 amps.

Knock Sensors

Signal – To ECU Knock input

GND – To ECU sensor ground

Knock sensors do not require a voltage supply. They should be wired with shielded, twisted pair wire. Shield should be drained to sensor ground at the ECU

T-Series

Generic Connections

VR (magnetic) Sensor

Trigger – To ECU crank/cam/wheel input

GND – To ECU sensor ground

Shield – To cable shield (not always used)

VR sensors do not require a voltage feed as the voltage is generated by the trigger wheel teeth passing the sensor. VR sensors must be connected to the ECU with shielded, twisted pair wire and the shield should be terminated to ECU sensor ground. VR sensors are generally 2-pin, like common Ford sensors but can also be 3-pin, like common Vauxhall sensors. In the case of 3-pin sensors, the third pin should be connected to the cable shield. For 2-pin sensors, the shield should only be connected to the ECU sensor ground. Pin orientation is important; when using the crankshaft oscilloscope, if there are 2 yellow bars which are regularly much taller than the rest, the pins need to be swapped around.

Hall Effect Sensor

Supply Voltage – 5v from ECU or 12v from vehicle

GND – To ECU sensor ground

Signal – To ECU crank/cam/wheel/analogue input

Hall effect sensors are generally 3-pin (unless multi-output) and require a voltage supply. When used for crank/cam position or wheel speed sensing, the wiring should be shielded and the shield grounded to the ECU sensor ground When used for throttle position or gear position, shielding is not normally required. In both cases, the wires must be twisted.

NOTE: THE CRANK, CAM AND WHEEL INPUTS CAN BE EITHER VR OR HALL EFFECT. YOU MUST SET WHICH TYPE YOU ARE USING IN THE ECU SOFTWARE.

Temperature (NTC) Sensors

Signal – To ECU thermistor/analogue input

GND – To ECU sensor ground

NTC temperature sensors change in resistance depending on the temperature they are measuring. They are 2-pin sensors but the pin orientation is not important. The ECU has dedicated Thermistor inputs for temperature sensors which have an internal 1kΩ pull-up resistor. You can also use these sensors with a regular Analogue input but you must include an external pullup resistor between 5v and Signal.

Pressure Sensors (liquid & air)

Supply Voltage – Usually 5v from ECU

GND – To ECU sensor ground

Signal – To ECU analogue input

We only ever recommend the use of 3-wire pressure sensors as if you used a single wire sensor with a pullup resistor to 5v, it would ground through the engine and cause erratic readings.

MOST SENSORS REQUIRE 5V WHICH CAN BE TAKEN FROM THE ECU OUTPUT. YOU CAN ALSO USE 12V SENSORS, PROVIDED THEY HAVE A 5V OUTPUT

T-Series

Generic Connections

Amplified Coil

12v – From same supply as ECU

GND – To ECU power ground

GND – To cylinder head (not always present)

Trigger – To ECU (ensure ECU set to amplified coils)

For coil packs, there will be at least 2 triggers (e.g. output 1 &2, output 3&4). Amplified coil-on-plug units can be 3 or 4 pins.

Non-Amplified Coil

12v – From same supply as ECU

Trigger – To ECU

GND – To ECU power ground (not always present)

For coil packs, there will be at least 2 triggers (e.g. output 1&2, output 3&4). For cannister coils (distributor engines), wire the negative terminal to ECU pin Coil 1. Non-amplified coil-on-plug units can be 2 or 3 pins.

Injectors

12v – From Same supply as ECU

Trigger – To ECU

Injectors generally have no orientation for the pins. It's best to wire them all in the same way but pin 1 can be the 12v supply or the ECU trigger.

NOTE: BY DEFAULT, COIL AND INJECTOR OUTPUTS FIRE IN SEQUENCE. COIL/INJECTOR 1 FIRES FIRST, COIL/INJECTOR 2 FIRES SECOND ETC. THE T-WIN SOFTWARE ALLOWS FOR CHANGING THE OUTPUT ORDER TO FIRING ORDER

Aux (PWM) Outputs

Aux outputs are limited to 1 amp and are of the low side drive type – i.e. they pull to ground. In most cases they should be wired to the coil of a relay (86). For devices that require PWM control, you can either use a solid-state relay or, if the current draw of the device does not exceed 1 amp, you can wire the low side directly to the ECU. Generally speaking, most PWM controlled camshaft valves can be wired directly but non-PWM valves require a relay. Always be sure of the current draw before wiring directly.

Power & Ground

The ECU has both a permanent live feed and an ignition live feed. Both should be fused but at a minimum, the permanent live must be fused. Power should come from the battery, not the alternator. The ground terminals should always be connected to the cylinder head and the cylinder head should have a path back to the battery negative (usually via cylinder block) to prevent interference. As an additional precaution, you can fit the fuse to the ground side if there is risk of 12v touching the case but generally the anodising should protect against this.

H-Bridge Outputs

H-Bridge outputs normally control fly-by-wire (eGas) throttle motors. The "+" output should be connected to the terminal that opens the throttle, the "-" output should be connected to the terminal which pulls the throttle closed.