

Spitronics - ECU - First Start - Quick Checklist

Use this checklist together with the Spitronics - ECU - First Start and Basic Setup - Guide. Complete the checks in order.

Important: Do not jump directly to starting the engine. If any check fails, stop and correct the problem before continuing.

Stage 1 - Before Power-Up

Engine and Installation

- [] ECU and harness installed according to the applicable wiring documentation and Safety and Wiring Precautions Guide.
- [] ECU earths, engine earth and battery earth connections are secure.
- [] Correct fuses are fitted.
- [] ECU jumper settings have been verified.
- [] Spark plugs and injectors are suitable and serviceable.

Fuel System

- [] With the ECU disconnected, fuel pressure has been checked where applicable.
 - [] Fuel pressure is suitable for the installation - approximately 3.5 Bar where applicable.
 - [] No fuel leaks are present.
 - [] Fuel pump wiring is restored to normal after the independent pressure test.
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Stage 2 - Before Starting

First Power-Up

- [] Remove all fuses and disconnect coils, injectors and fuel pump where applicable.
- [] Connect only the P1 input connector for the first power-up.
- [] Switch ignition ON without cranking.
- [] ECU Power LED illuminates normally.
- [] Idle stepper LED illuminates if fitted.

Stop: If the ECU Power LED does not illuminate, switch off immediately and find the fault.

Laptop and Sensors

- [] Laptop connects to the ECU software correctly.
- [] MAP and TPS readings are sensible.
- [] Coolant / Water and Air Temperature readings are sensible for the current engine temperature.
- [] Battery Voltage is correct.
- [] Altitude, Fuel Pressure and POT sensors are checked if fitted.
- [] Sensors that are not fitted are disabled.

ECU Setup and Calibration

- ☐ Crank and cam sensor settings are correct.
- ☐ Trigger angle is correct.
- ☐ Rising or falling trigger edge is correct.
- ☐ Distributor rotor phasing is correct where applicable.
- ☐ TPS is calibrated.
- ☐ MAP is calibrated.
- ☐ Coolant / Water Temperature is calibrated.
- ☐ Air Temperature is calibrated.
- ☐ Altitude Sensor is calibrated if fitted.
- ☐ MAP and Altitude readings are approximately local atmospheric pressure with the engine stopped.
- ☐ Safe Maximum RPM limit is set.
- ☐ Safe coil charge time is set. Start conservatively if the coil requirements are unknown.

Cranking Signal Test

- ☐ Crank Sensor Test is enabled.
- ☐ DTC codes are cleared before testing.
- ☐ Engine cranks at approximately 100-200 RPM.
- ☐ RPM signal is stable.
- ☐ No crank error DTC codes are present.
- ☐ MAP moves slightly away from atmospheric pressure while cranking.

Stop: Do not continue if RPM is erratic or crank errors are present.

Ignition Timing

- ☐ Base timing is set to approximately 10 degrees BTDC.
- ☐ Actual ignition timing has been checked with a timing light.
- ☐ Actual timing is stable and agrees with the ECU timing.

Stop: Do not proceed if ignition timing is incorrect.

Injector and Fuel Check

- ☐ Injector Ratio is approximately 100% for the initial check.
- ☐ Fuel Offset is approximately 0% for the initial check.
- ☐ Calculated injector time is sensible for the engine and injector size.
- ☐ For a typical naturally aspirated engine with standard injectors, approximately 11-13 ms around local atmospheric pressure can be used as a general sanity check.

Stop: Do not enable the fuel pump if the calculated injector time is clearly unreasonable.

Relay and Output Tests

- ☐ Required ECU connectors have been reconnected.
 - ☐ ECU-controlled relays switch on for approximately three seconds and then switch off.
 - ☐ Injectors operate correctly.
 - ☐ Fuel pump primes correctly.
 - ☐ No relevant ECU errors are present.
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Stage 3 - First Start and Preparation for Tuning

Before Starting

- [] Oil pressure has been verified during cranking.
- [] Fuel system has no leaks.
- [] Ignition timing has been verified.
- [] Fuel calculation is sensible.
- [] No relevant DTC codes are present.

First Start

- [] Start the engine without unnecessary throttle input.
- [] Engine starts and continues running.
- [] Oil pressure is correct.
- [] No fuel, oil or coolant leaks are present.
- [] Engine sounds mechanically normal.
- [] Sensor readings remain sensible.
- [] Do not unnecessarily rev the cold engine.

Starting Fuel Checks

- [] Start Prime Pulse provides sufficient fuel for initial starting.
- [] Throttle Priming operates if required for testing.
- [] Flood Control operates above approximately 80% throttle during cranking.
- [] Cranking Fuel is reasonable for the application.
- [] Start Enrichment keeps the engine running after it initially starts.
- [] Excessive black smoke is not present.

Initial Idle

- [] Engine can maintain a reasonably stable idle.
- [] Basic fuel is adjusted sufficiently to keep the engine running correctly.
- [] Idle Control is not being used to hide an incorrect base fuel or ignition setup.

Preparation for Basic Tuning

- [] Engine is at normal operating temperature.
- [] All fitted sensors are calibrated and reading correctly.
- [] Correct Tune Mode and fuel/timing tuning method are selected.
- [] Cooling fans and other essential outputs operate correctly.
- [] Altitude Sensor is configured if fitted.
- [] Maximum RPM is set approximately 500 RPM above the highest planned tuning RPM.
- [] Boost, temperature and other engine-protection limits are set safely.
- [] Turbo Boost Limit is approximately 0.1 Bar above planned maximum tuning boost where applicable.
- [] Battery compensation is disabled or minimised where applicable.
- [] Lambda correction is disabled.
- [] POT correction is disabled where applicable.
- [] Accelerator Pump compensation is disabled or minimised for basic tuning.

[] MAP Accelerator compensation is disabled if it causes unstable injector time.

Ready for Tuning

[] Engine starts reliably.

[] Idle is reasonably stable.

[] Sensor readings are correct.

[] Ignition timing has been verified.

[] Fuel calculation is sensible.

[] Essential outputs operate correctly.

[] Engine protection limits are configured.

The engine is now ready for basic fuel and ignition tuning.