Spitronics - ECU - Idle Setup and Stabilisation - Guide

1. Overview

This guide stabilises the engine after first start and prepares it for tuning.

The goal is to achieve:
• Stable idle
• Correct fuel mixture
• Smooth engine response

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2. When to Use This Guide

• Engine starts but does not idle
• Engine stalls after start
• Idle is unstable or rough

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3. Requirements

• Engine running
• Ignition timing verified
• Fuel system tested

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4. Base Setup Before Adjustment

Ensure:
• Injector Ratio = 100%
• Fuel Offset = 0%

Your fuel graph should:
• Reach approximately **15 ms** for a standard engine
• Must be lowered for modified or high-boost engines

👉 in this case leave the graph as is for now and reduce injector ratio slightly before starting adjustments

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Method 1 – Injector Ratio Adjustment (Primary Method)

Use injector ratio to quickly find a stable running point.

Procedure
1. Keep engine running using slight throttle
2. Hold engine at lowest possible stable RPM
3. Adjust injector ratio using hotkeys:
   • Q → Increase by 1
   • A → Decrease by 1
   • W → Increase by 10
   • S → Decrease by 10
4. Observe engine response

Goal
• Find point where engine runs smoothly
• Gradually reduce throttle input
• Achieve natural idle

Important During Adjustment

Keep in mind:
• Water temperature compensation adds extra fuel
• As the engine warms up, this compensation reduces

When adjusting for best performance:
• Monitor the vacuum bar
• If the engine improves → vacuum increases (bar moves left)
• If the engine worsens → vacuum decreases (bar moves right)

The same applies to the matrix view, but the realtime bar gives better resolution.

Ratio Correction
If engine struggles to idle:
• Lower injector ratio by ±10
• Save and restart
If worse:
• Increase ratio
👉 Always start leaner first
(A rich mixture can wet plugs and worsen starting)

Returning Injector Ratio to 100%

Once the engine reaches working temperature:
• Gradually return Injector Ratio to 100%

To do this:
1. Adjust Injector Ratio closer to 100%
2. Adjust the fuel graph in the opposite direction to compensate

Use:
• Easy Tune → Tune All
• Fine resolution hotkey: **D**

Once Injector Ratio is at 100%:
• Find the best idle vacuum by adjusting the graph
• Save settings in the ECU

Timing Verification
Now start the engine again and perform a fine timing check.
1. Set maximum timing to **10°**
2. Use a timing light to verify actual timing
3. Adjust in software:
   • Gear Teeth (coarse)
   • Timing BTDC (fine)

Continue until software timing matches actual timing.

Put the maximum timing back where it was.
Save settings again.

Throttle Response Adjustment
At this stage:
• Blip the throttle
• Adjust accelerator settings to eliminate flat spots

Method 2 – Fuel Graph Adjustment (Easy Tune)

Once engine runs reasonably stable, switch to graph adjustment.

Setup
• Easy Tune → Tune All
• Use hotkey **D**

Procedure
1. Keep engine running using throttle
2. Hold lowest stable RPM
3. Adjust entire fuel graph up/down

Observe:
• Improves → continue direction
• Worsens → reverse direction

Once close:
• Press **D** for finer adjustment
• Continue until smooth running is achieved

As the engine warms up:
• Keep adjusting until full operating temperature is reached

If the engine struggles to idle and dies:
• Move the graph down slightly and save
• Restart and evaluate

If worse:
• Move the graph up

👉 Again, start by going leaner first
Save your settings.

👉 Adjust continuously until operating temperature

Final Target
• Injector Ratio = 100%
• Best idle vacuum achieved
• Stable idle
Save settings.

Throttle Response

• Blip throttle
• Check for flat spots
If needed:
• Adjust accelerator settings

Timing Verification

1. Set maximum timing to ±10°
2. Verify with timing light
3. Adjust:
   • Gear Teeth (coarse)
   • Timing BTDC (fine)

Ensure:
• ECU timing matches actual timing
Restore original timing value and save.

⚠ 5. If Not Correct

• Dies → too lean
• Rough idle → too rich or unstable
• No response → setup or sensor issue

📌 6. Notes

• Always start slightly lean → increase gradually
• Rich mixtures can wet plugs and cause false tuning results
• Use vacuum as primary tuning indicator
• Do not adjust multiple parameters at once

🔗 7. Reference Links

i First Start and Basic Setup – Guide