Notes on L-Jetronic info gathered from Tero Katajainen's page (The Desperate Tuner)

The page was at http://www.students.tut.fi/~katajain/index.html
It no longer exists, but is mirrored in various places around the Web.

Unfortunately many of his comments are rather ambiguous and the graphs are often cryptic. I think I have figured out most of the confusing stuff. These are the high points:

For performance, these two seem most important:

R106: Rev limiter. Decreasing value raises rev limit.
TR7 ECU = 620K (in parallel with R110, 120K)

R103: Sets enrichment vs. RPM. Increasing value gives greater enrichment as RPMs increase.
TR7 ECU = 620K (in parallel with R104, 47K)
Enrichment increases until it hits a limit determined by airflow, then levels out. So this ends up setting mid-range enrichment.

I doubt the following two resistors need tweaking unless large engine changes have been made.

R237: Sets upper bound for airflow signal influence during cranking.
TR7 ECU = not used (in parallel with R238, also not used)

R239: Sets lower bound for airflow signal influence during cranking.
TR7 ECU = 47K (in parallel with R240, 6.8K)

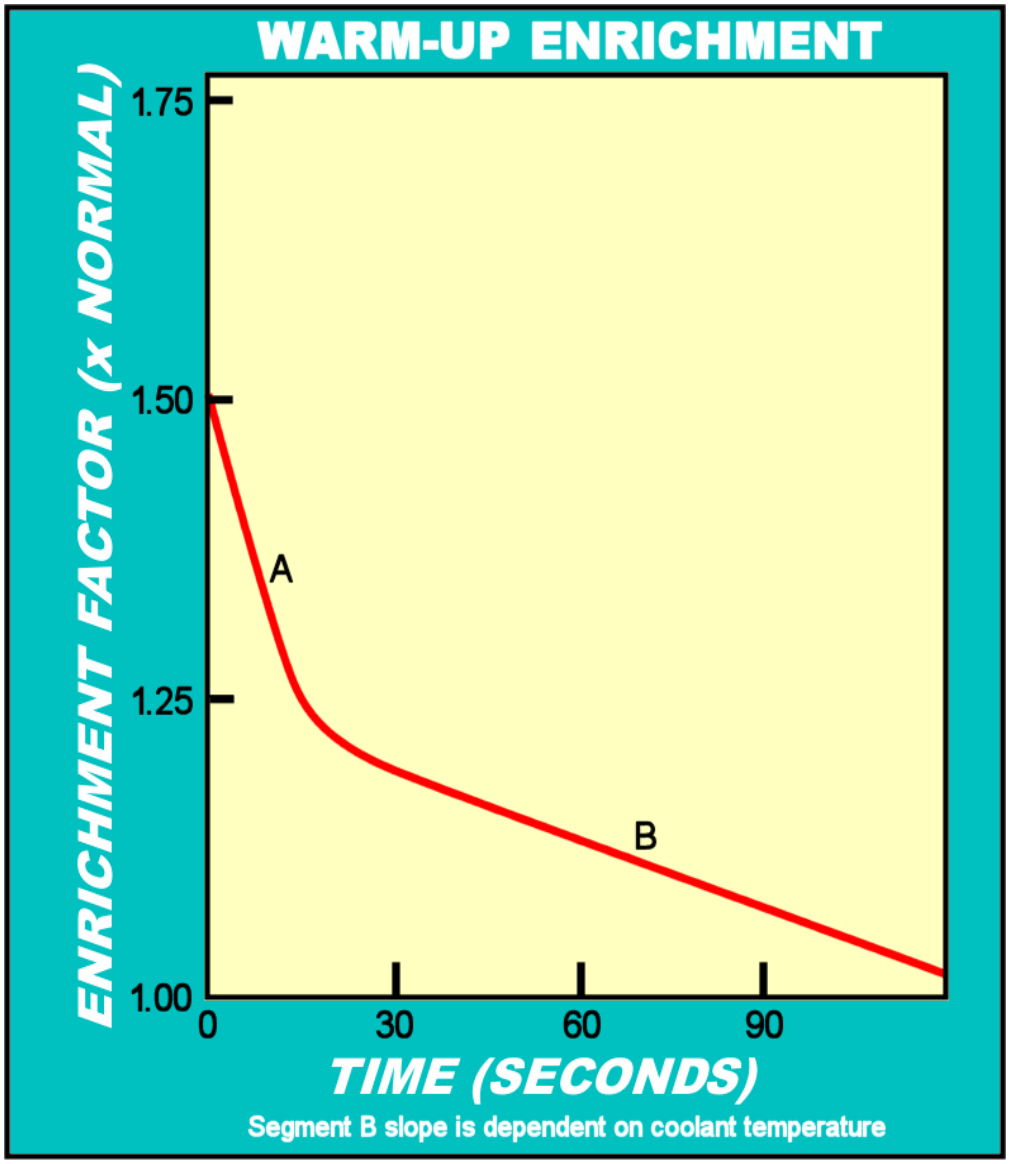
This entire section doesn't exist on a TR7 - no coasting-cutoff due to emission control.

R758: Fuel cut-off speed (for coasting-cutoff).
TR7 ECU = n/a

Warm-up Enrichment:

These shouldn't need tweaking unless large engine changes make it stumble during warm-up.

R616: Part-throttle and post-cranking warm-up enrichment only work **below** a coolant temperature specified by R616.
TR7 ECU = 470ohms (in series with R615, 1.3K)



(This graph is from page 12 of the L-Jet + Lambda manual)

R617: Post-start and temp. warm-up enrichment amount. Smaller value = less enrichment. (Section A on graph)
TR7 ECU = not used (but is in parallel with R618, 36K)

R306: The timing of post-start warm-up enrichment. Bigger value = longer enrichment. (Section A on graph)
I'm pretty sure he made a mistake reading the PC board. I think it should be should be R309.
TR7 ECU = 270K (R306) ------- R309 = 51K in parallel with R308, 5.1K

R621: Part-throttle warm-up enrichment amount Smaller value = more enrichment. (Section B on graph)
TR7 ECU = 130K (in series with R620, 130K)

R624: Part-throttle warm-up enrichment decay speed. Smaller value = faster decay. (Section B on graph)
TR7 ECU = 91K (in parallel with R625, 18K)

Miscellaneous:

The part-throttle enrichment, post-cranking enrichment and and coasting-cutoff are on the Aux board.

The wide open throttle (WOT) enrichment is fixed at ~9%.

The injection time is corrected to compensate for the different opening times of various injectors . This is set by R345.
TR7 ECU = 6.2K (in parallel with R346, 51K)

The injectors are opened with ~4A/injector.
After ~.5 mSecs the total current is held at a current level determined by R408 (Typical ~2A).
TR7 ECU = 1.8K (in parallel with R407, 33K)

This is a modified version of page 15 of the Bosch L-Jet + Lambda manual

Outline font (HJ11) denotes module or IC identifier on pc board

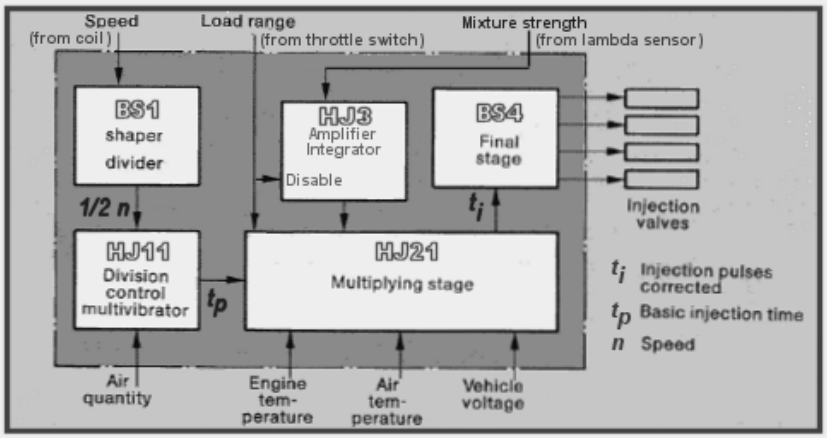
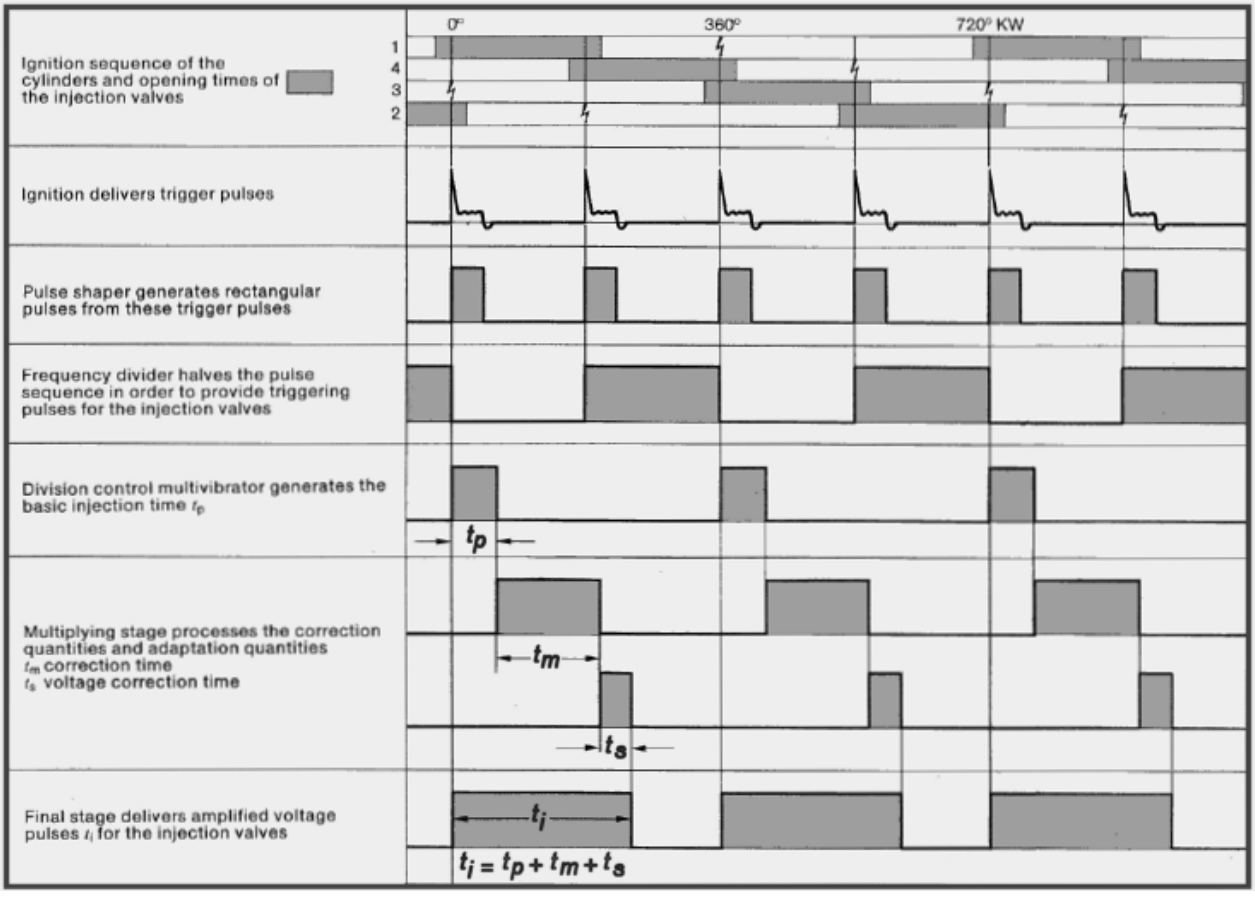


Fig. 35 Block diagram of the control unit



A couple of notes from GT:

There are four transistors in the TR7 ECU output stage. Two of them may appear to be of the wrong polarity - they are not. The 'top' three transistors in the output stage manage the spike generated when the injectors are turned off. They control current flow through the flyback diode, D402. The reverse current generated by the inductance of the injectors when they are turned off that flows through D402 keeps the injectors turned on. Interrupting that current allows for very short pulse widths when necessary. The spike is more positive than 12V, so the transistors are properly biased.

A note on the airflow meter: Katajainen's page says "the output-voltage/flow relationship is linear". I don't believe it is. The graph of the various transfer functions in the system on page 11 of the L-Jet + Lambda manual shows that the ECU transfer function is curved to 'correct' the input from the airflow meter. (Actually, the airflow meter output is 'curved' to correct for the curved transfer function of the ECU - it's a lot cheaper, easier and simpler to design the analog circuitry in the ECU with a curve and fix it by tweaking the taper of the potentiometer inside the airflow meter.)

I think these notes are correct, but I have not done a complete job of verification yet, so be skeptical.