Re-map Lucas 14CUX Firmware for Rover V8

I started working on remapping the Lucas 14CUX in 2013 after our American friends Dan and Colin reverse engineered the 14CUX program code back in 2011 and published all the internal addresses of the 14CUX in 2012.

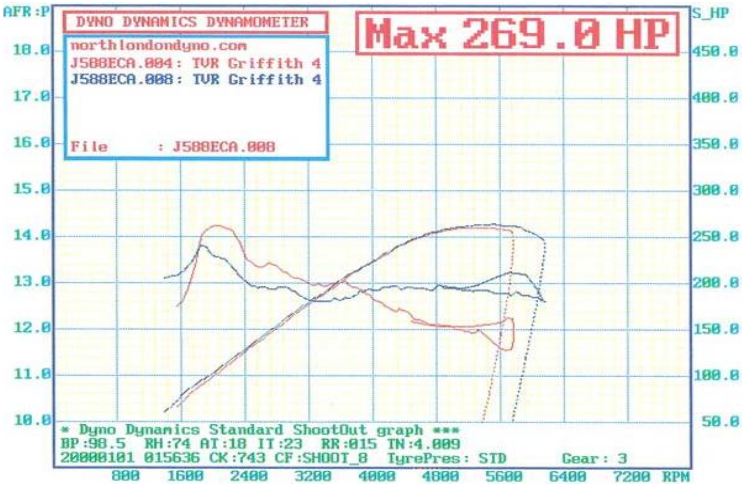
In August 2013 I published my first Instruction to Remap the 14CUX on PistonHeads and since then Jools (Spitfire4v8) has successfully fully remapped 12 TVR Griffith or Chimaera on his rolling road including successfully rescaling the fuel table for larger Air Flow Meters. With Colin and Dan's help I've now extended the fuel table from 5,500 to 6,200 RPM, eliminated overrun shunting on my TVR Griffith Precat and enabled my MIL lamp, plus I now run Land Rover's final ECU program code called Operation Pride with the improved idle control.

In Spring 2014 I successfully re-mapped my Griffith Precat 4.3 myself from RoverGauge logs and my AFR logs created while driving safely & normally on the roads. Once back home I downloaded & merge the logs that then shows the AFR for each cell in the fuel table and can be used to re-map the fuel table. You can see from the graph on the right I used the extend fuel table to 6200 rpm that allows control of the fuelling past the stand Land Rover 5,500 rpm.

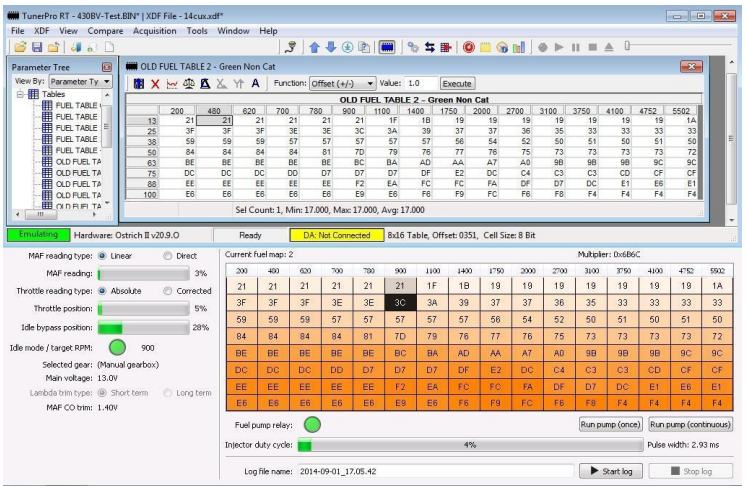
August 2014 was the first anniversary of my instructions to re-map the 14cux and since we've made huge progress it seems a good time to publish much simpler instructions with as little computer jargon as possible. You no longer have to understand the complexities of the chip or correct the checksum as the free program called TunerPro does it all for you, but you'll need a Windows laptop, to run RoverGauge and a RoverGauge Cable for £35 and a chip writer for £35.

In Spring 2015 we proved you can re-

Re-mapped myself from data logs with extended Fuel Table



Re-mapping 14CUX with RoverGauge & TunerPro



map the cat map without lambda control by coping map 5 with multiplier to map 2 and setting the CO trim to the mid point of 1.25 volts that equals lambda long trim 0%. When finished simply copy the new map back to map 5. Also in Spring 2015 I extended the RPM brackets from 6200 to 6250 rpm with a smoother RPM table curve that helps keep the AFR smooth between the RPM set points.

I've listed the 14CUX tuning options now available with the simpler instructions that are ideal for copying a TVR chip into a non TVR ECU or making simple changes to idle speed, RPM limiter etc. I've also described the gadgets & procedures to self re-map on your local rolling road or from data logs created while driving safely on the roads. You can download for free my modified chip tune files for standard TVR Griffith Precats with the improved idle control program with or without the extended fuel table to 6200, not to be confused with RPM limiter. I've already had very positive feedback from one owner who said "I'm impressed version R3652 is much smoother and is what I've always been looking for"

If like me you are determined to re-map the 14CUX yourself then please feel free to use the following instructions and download links.

14CUX Tune / Firmware Files free to download, including extended fuel tables and reduced shunting
Land Rover & TVR OEM 14CUX Firmware / tune settings
Tuning Options & Simplified Instructions to update maps/tunes
Self re-mapping 14CUX on a rolling road or while driving with a gas analyser
Software and Gadgets required
Prom / Firmware Memory Addresses & Technical Notes

Summary

I'm still in shock we can now do most things an engine tuner would hope for with the 14CUX from a simple idle speed adjustment to a full remap with different AFMs and capacities. I've resolved my slow speed shunting and now never have to dip the clutch, plus I've resolved the fuelling issues above 5,000 rpm and fixed my MIL lamp. At the very least I hope this 14CUX effort will help reduce the number of 14CUX casualties like the latest one that you may have read about on this PistonHeads thread.

Should you have any questions or suggestions to simplify any of the instructions above please do not hesitate to email me via my SteveSprint PistonHeads profile, but please remember I'm not in the motor trade or computer industry and I'm doing this for fun in my limited spare time.

The Future

Although we've now addressed the main issues and made the engine drive better there is always room for further improvements like the warm up idle speed, Amethyst mappable ignition, RoverGauge logging at very high rpm and simplify remapping from data logs. Plus I'm allowed to dream of replacing the AFM with a Manifold Pressure Sensor and an Air Temperature Sensor or adding mappable ignition to the 14CUX as one person did a long time ago.

Acknowledgement

Dan and Colin deserve all the credit for cracking the 14CUX code and giving us RoverGauge. Also thanks to Mark (Blitzracing) for explaining the sensors and hardware signalling, Robert for kick starting Tunerpro, Matt for the 14CUX Toolkit and Dave for helping me understand the 14CUX program code.

I’m not the brains behind this effort just the monkey testing and documenting everything I’ve learnt from everyone else on the PistonHeads thread Instructions to change fuel maps on 14CUX .

Apologies

I’m sorry I can’t offer any tuning advice on individual modifications as re-mapping the fuel table is still best left to the engine tuning experts like Mark Adams and Jools (Spitfire4v8). They both have many years’ experience and know the fuelling requirements for the different engine loads & RPM points. I should also point out that both self remapping methods are very time consuming as every entry in the 16 by 8 fuel table has to be remapped individually.

Finally, always keep your original chip in a safe place as a fallback and always work on a spare EEPROM chip and I’m sorry there is absolutely no warranty.