LS1 tuning comes of age

Real time LS1 tuning is now a reality. EFILIVE, in conjunction with Moates Tuning solutions, has developed a package that allows the LS1 tuner to programme the computer on the fly, to get the best out of any combo.

Why Real-Time?

Real-time tuning allows the tuner to make small changes and quantify the effect they have on the car instantly. The operator can hold the engine at set speeds and loads, and see instantly if the engine makes more power, is more efficient or produces better emissions, depending on that particular requirement at the time. The tuner can then move onto the next load point. Idle adjustments and part throttle tuning is where real-time comes into its own.

With most off-line tuning systems the computer needs to relearn its idle conditions and spark trims every time the computer has a program flashed into it. But with the real-time solution the engine does not need to be turned off and the tuner can instantly see the changes on the scanning tool – in much the same way as a Motec or Autronic system does but with even more control.

To use the system, a real-time computer is fitted to the vehicle and a USB Bluetooth adapter is fitted to the real-time computer; then any operating system or custom operating system is uploaded to the computer and tuning can begin. The laptop is connected to the car's PCM (Power Control Module or computer) and then a connection is established between the laptop and the real-time PCM. Any of the normal EFILIVE Flashscan tables can be accessed and changed instantly, making the changes permanent in the PCM. The car can be run on the dyno and later on the road, to fully optimise the tune as required.

While tuning, you can data log and monitor all the engine parameters and make changes as required. The software has tracking features that allow the user to see exactly which tables are being accessed, and where, so changes

Inside the real-time computer.

Real-time computer being fitted.

can be made to either the exact load point being used, or in the areas around it – thus optimising the tune. By tuning in real-time you are able to see exactly where the engine is accessing the data from, which in some cases – such as the spark table – can be in places than you would not normally estimate, as the load signal changes due to intake harmonics.

On the dyno, the power curve can be minutely manipulated very quickly to get the perfect WOT tune, then part throttle tuning can be done to optimise every point in the mapping. With the old off-line editors you needed to make a minimum of 360 changes to get every load point right just in the base fuel maps (double that number for a supercharged tune). What used to take days to do effectively now can be done in a matter of hours, with much more precision. This translates to a better quality tune for the end user, with less danger of compromising the tune due to guesswork.

The real-time system, combined with the ability to use custom enhanced operating systems, enables extra features like NOS control to be added. In addition, boost timing retard and extended Volumetric Efficiency tables for supercharged applications can be included. Valet mode switches can be added and tested while the vehicle is in operation to find the ideal set points. This has led to a lot of people talking about "locked" tunes but in reality every tune is locked – even the factory tunes. A tuner unlocks these codes by hacking the PCM and developing the required definition files so they can access the code. We then re-write the code to allow our real-time and custom operating systems access, so this uses different calibration codes than the standard Holden ones. Any competent tuner that understands how the PCM operates can make a definition file to open these tunes but most new tuners do not have any software hacking experience, they have just bought a software package expecting it to do all the work for them.

The beauty of these custom operating systems, is that they appear to the Holden diagnostic tools to be genuine calibrations, so they can scan them for

operation during a normal service but they cannot overwrite them using the standard calibration codes. This ensures that the customer does not lose their tune while having their car serviced, which is a very real problem with some other tuning products. No one wants to pay for a tune and then have it deleted by a Holden technician, only to have to pay again for the tune or revisit the tuner to get their programme put re-loaded. So, if your tuner tells you the PCM is locked then it may be time to look for a new tuner.

Source:
Chipmaster.
(08) 9452-0213.

psc