



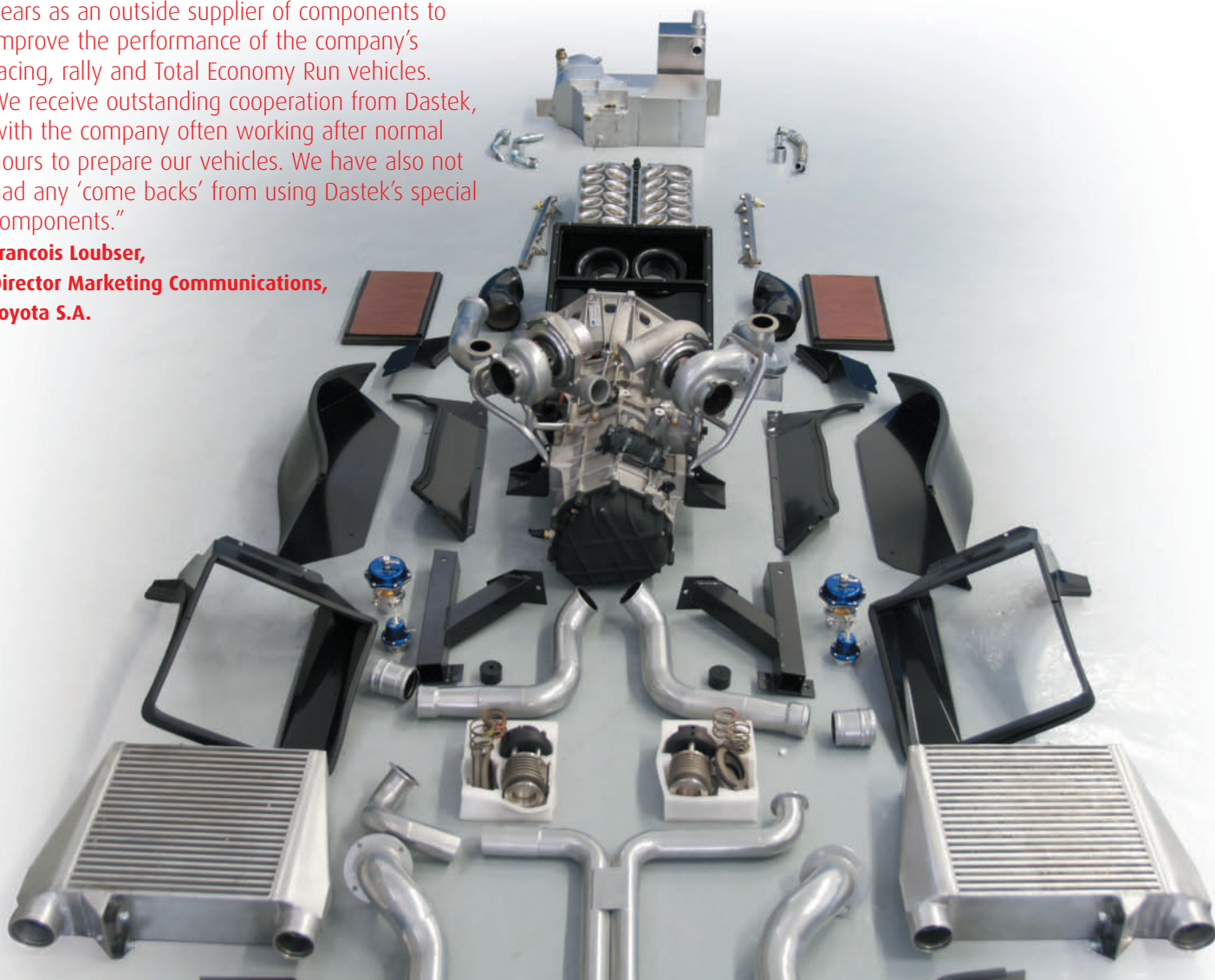
Take Control, with the Unichip Q

Power, they say, is nothing without control and with the latest evolution of the acclaimed Unichip engine management module puts the control firmly in the hands of the skilled tuner. The result is the ability to optimise a vehicle's engine for a wide range of operating needs and conditions like never before.



“Toyota South Africa has made extensive use of Pieter de Weerd’s company, Dastek, for many years as an outside supplier of components to improve the performance of the company’s racing, rally and Total Economy Run vehicles. We receive outstanding cooperation from Dastek, with the company often working after normal hours to prepare our vehicles. We have also not had any ‘come backs’ from using Dastek’s special components.”

Francois Loubser,
Director Marketing Communications,
Toyota S.A.



This is not a DIY system where one size fits all. It is not a serial download that alters Engine Control Unit settings (which are integral to the vehicle and can be detected by diagnostic equipment and can be erased by a dealer). Rather, the device ‘piggy-backs’ on an existing ECU and is programmed for that particular engine to achieve the absolute highest efficiency and performance which can safely be extracted from it.

And by doing that in real-time (under load on a rolling-road dynamometer) a trained technician is able to plot the perfect map for the engine to follow across any contours, allowing the best of both worlds: economy under light load conditions and maximum performance under full throttle. In broad terms, about 3 120 points can be plotted and altered, each one optimised for that very engine. This is akin, as Pieter de Weerd puts it, to fitting it with a three-piece suit tailor-made for an engine: petrol or diesel, big or small, turbocharged or normally-aspirated.

As is the case with every Unichip since

he first introduced this revolutionary product, the process is fully-reversible and an engine can quickly be restored to its original settings in the unlikely event of the customer not being 100 percent happy with the results.

An exciting feature of the new Unichip Q and Q+ is its ability to communicate with certain Bluetooth-compatible telephones and PDA devices. This allows the car’s owner to choose from five pre-determined maps – allowing the driver to also exert a previously unheard of measure of control over his engine.

For example, one map may limit engine and road speed – ideal for when the car goes for a service or when it is loaned to another family member. Another setting would be designed for track-day usage, allowing the engine to enjoy the benefits of racing fuel and/or higher turbocharger boost pressure. Fleet owners will appreciate the Unichip’s ability to control the engines of taxis and commercial vehicles for the purpose of safety and economy. And for those who like life to be fun, a

setting could allow the car to backfire on a trailing throttle and – in the case of the Lamborghini – shoot metre-long flames out of the exhausts!

Another new feature is the ability for its firmware – the electronic programming embedded in the microchips themselves that enable the hardware to communicate with the software – to be upgraded to allow it to take advantage of future developments.

“Electronics in general and engine management systems in particular are fast-changing fields,” says De Weerd. “Keeping ahead of the game in a world where control is often taken away from us is challenging to say the least, but with the Unichip Q and Q+ those looking to extract the very best from an engine can once again make educated and meaningful improvements to sophisticated systems. I think the twin-turbo Gallardo, where nearly all the engine and some transmission functions are controlled by Unichip computers, makes that point emphatically.”

LAMBORGHINI GALLARDO TWIN-TURBO

The Lamborghini Gallardo you see on these pages is no ordinary Lamborghini Gallardo - though that in itself sounds like a contradiction in terms. This car was built with the express purpose of showcasing the possibilities that the new Unichip Q brings and what better way than with what may well be the fastest-accelerating production-based car in the world?

To achieve that goal, Pieter de Weerd, inventor of the Unichip, calculated that the engine would have to produce in the region of 1 350 horsepower, or about 1 000 kilowatts. In standard form the 5.0-litre V10 behind the cockpit of a Gallardo makes 382 kW... so building an engine able to withstand two-and-a-half times as much power was a daunting task. As a starting point, the internals of the engine were substantially revised with aftermarket pistons and connecting rods, though the bottom end and the block itself are unchanged.

A compact and efficient installation of the twin turbochargers - configured specifically for this installation - and their plumbing shows the high level of workmanship and professionalism, while the shortened exhaust system required some modification to the rear of the car. The intercoolers (and their water spray cooling systems) and other components had to be packaged into an engine bay where space was already at a premium. Despite this, the end result suggests that the job was done at the Lamborghini factory, to the point where even new grilles and covers were manufactured in the style of the originals. From the outside, it looks pretty innocuous.

Despite remaining largely unchanged in terms of bodywork, this is an extreme makeover by any standards. Because of the engine's massive fuel and air needs a bespoke airbox was built with huge filtering capability but more to the point, extra fuel needed to be delivered to the cylinders. At full throttle, this engine gulps about six litres per minute.

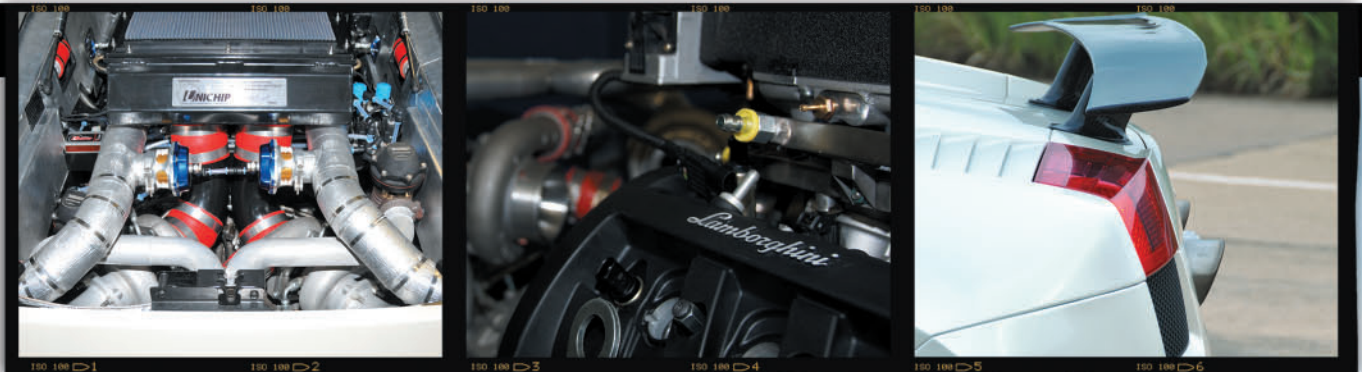
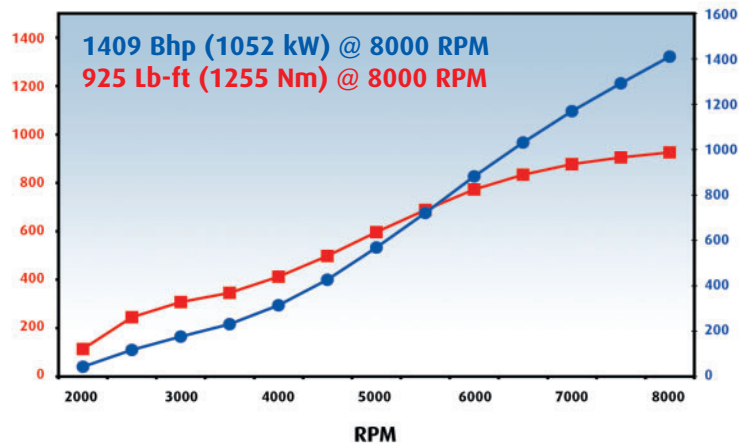
To deliver this an extra fuel injector was fitted into each intake tract, and it is at this stage of proceedings that the Unichip Q really becomes an essential part of the equation: it has the capability to control extra fuel injectors sequentially synchronised to the original injectors and along with a pair of Unichip injector drivers, it manages all the fuel requirements of the engine.

A second Unichip Q looks after the e-gear shift system which features a robotic clutch, now mated to a high-performance, twin-plate copper button clutch. Q's ability to

manage technology such as launch control has been invaluable in this regard.

In dynamometer tests conducted on South Africa's inland plateau, the car does indeed produce 1 400 horsepower, with the boost pressure set at 1.2 bar. In subsequent performance runs, verified with a VBOX GPS-based data logger, the car accelerated from standstill to 300 km/h in approximately 16.5 seconds. Acceleration from 100 to 200 km/h takes about 4.5 seconds and from 200 to 300 km/h another eight seconds.

This then is a very extreme application of the Unichip technology and for De Weerd it is almost a case of mission accomplished. With fine-tuning though, he believes the car should be capable of a 14.5 second run to 300 km/h once the gearshift is perfected and a revised viscous coupling is mated to the front differential to quell what he matter-of-factly describes as: "a traction problem between 100 and 200 kilometres per hour..."





THE UNICHIP, A BRIEF HISTORY

As a trained automotive technician with a keen interest in electronics Pieter de Weerdts began looking for intelligent ways to extract more out of an engine from when he could first drive. As management systems become more sophisticated and were improved to prevent any 'unauthorised' external intervention, he came up with a method whereby an aftermarket tuner could actually work in harmony with the engine's electronics.

That was in 1995 and over the years the system has been refined, improved and

enhanced to the point where in some cases it is integral with some original equipment engine control systems. Since then endorsements from individuals, companies and Motorsport teams have been many.

"In the interests of safety, manufacturers tend to adopt a 'slightly too big' approach with a tendency to err on the side of caution," says De Weerdts. "What they're saying is that since they can only make one map for many vehicles, too big is safer than too small. I like to think of the Unichip as a set of tailor-made clothes for an engine –

in other words, to optimise rather than modify it."

The result was the first piggyback computer for an automotive application on the planet and today there are about 600 Unichip dealers across 57 countries, and that number is growing rapidly.

In development terms the Q chip represents the 25th evolution of Unichip technology and is proof that the Unichip remains better than the best and the most reliable and effective way of optimising a production engine.

Enquiries to Dastek on 012 347 1225 or e-mail dastek@icon.co.za. Alternatively visit www.dastek.co.za



As far as standard vehicles are concerned, for fuel economy and more performance, the Unichip is unbeatable. I have tried every known micro-chip and none of them even come close. Once you have mapped a vehicle with a Unichip and seen how user-friendly the software is, and what benefits you get out of it, one wonders how you have gotten by without it."

Steven Green, Rob Green Auto Services