



MODIFIED CAR – SUPERCHIPS GOLF 1.6 TDI

# Fast and frugal!

**The Superchips software upgrade for the 1.6 TDI produces an extra 40 PS, lopping a full 2 seconds off the 0-60 time, but can still return excellent fuel economy...**

**THE IDEA OF re-mapping the engine management control unit (ECU) to produce more power and torque is far from new. Indeed, companies like Superchips – one of the pioneers of the re-chipping business here in the UK – have been doing it for over 25 years now, on a wide variety of vehicles, for many different purposes.**

There's an obvious tendency to associate this sort of performance upgrade with highly modified cars for motorsport and track days; indeed, Superchips has seen more than its share of them over the years, having been involved with many major racing series and numerous modified specials.

But, although perhaps less exciting and somewhat less obvious, there's also a lot of potential for improving the performance of many lesser road-going models. It's well known that the TDI

diesel-engined models respond particularly well to engine management upgrades, often because they are deliberately under-rated performance-wise in standard form, leaving much more room for improvement. That it can be done without seriously compromising the reliability, longevity or fuel economy is so much the better.

Like most things involving modern technology, though, it's not getting any easier to access and manipulate the engine management mapping, and Superchips spends a lot of its time working with the latest technology, to perfect the performance upgrade well ahead of it becoming a popular requirement.

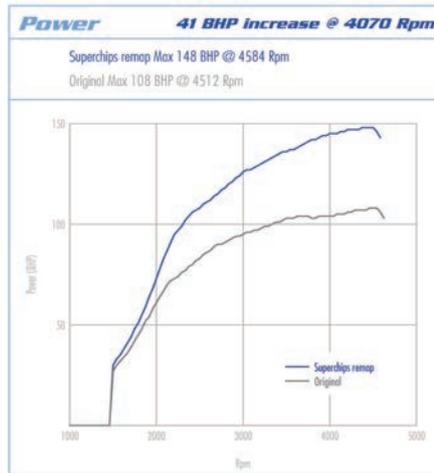
***'Superchips only release the upgrade when they're sure that it is suitable for use in the real world.'***

It's no secret that a lot of new cars – mostly the very latest models – come and go to and from the Superchips workshop, having been used as test beds for new software upgrades. After thoroughly investigating the ECU, manipulating the maps and testing the power increases on the rolling-road dyno, as well as during several weeks of everyday road use to perfect the improvements, Superchips only release the upgrade when they're sure that it is suitable for use in the real world.

It's certainly not just about artificially achieved peak power figures, as the conversions also have to be smooth, tractable and practical in everyday use. Even so, some very substantial improvements in performance can be achieved...

The most recent upgrade from Superchips is a re-map for the CAYC series 1.6-litre common-rail TDI engine that is currently used in the Golf range. In standard form, this is officially rated at 105 PS (77 kW) with peak power produced at 4400 rpm, and its maximum torque of 250 Nm is developed over a broad range between 1500 and 2500 rpm.

We've previously tested several standard Golf models with this very same engine,



ranging from the Mk 6 Cabriolet to Golf Plus and Estate, typically producing 0-60 times in the mid-10 to 12 seconds range, depending on weight and gearing, with average fuel consumption figures in the mid- to high 50s.

So, it was entirely consistent that, with the ECU still in standard form, the 4-door Superchips Golf 1.6 TDI produced very similar results when performance-tested using our VI Monitor, with the best 0-60 mph sprint completed in 10.9 seconds, 70 in 14.7 and 80 mph coming up in just under 19 seconds.

It's interesting to note that the Superchips dyno test showed slightly different power characteristics to those claimed by Volkswagen, with 108 bhp at 4512 rpm and 241 Nm at 2507 rpm, but it's the relative difference in performance that we'll be looking at here. It's to their credit that Superchips only promotes the exact improvement and doesn't compare their final results with the slightly lower original factory figures.

Unlike previous Superchips modified cars that we've tested, the new 1.6 TDI engine management software doesn't lend itself to switching readily between alternative maps. So, unfortunately, the company's excellent Bluefin module, which we've featured on several occasions, can't be used by the customer to change from standard to performance maps, and vice versa.

In this case, the new high-performance software has to be downloaded into the ECU by the Superchips staff at their workshop in Buckingham, by plugging their laptop into the OBD port. It's well worth the trip, and the short wait, though.

With the new Superchips software implemented, the 1.6 TDI is totally transformed. The dyno test plots show new figures of 148 bhp at 4580 rpm and 307 Nm at 2350 rpm. In fact, there's a maximum relative increase of 41 bhp at 4070 rpm and 70 Nm at 2350 rpm, both very substantial improvements indeed, and without relying on peaky power figures or spikey torque curves to distort the figures.

Out onto the open road with the VI Monitor, to measure the real-life performance, and the standing-start acceleration figures had all tumbled. Not by mere tenths, or half a second, but by exactly 2 full seconds for the 0-60 mph sprint, with the Superchips car exactly 3.0 seconds faster to 70 and 3.5 seconds quicker to 80 mph.

***'Performance is significantly improved, with a much stronger and smoother response in virtually all situations...'***

The in-gear acceleration times tell a similar story, with as much as two full seconds trimmed off the 50-70 mph time in fifth gear. That translates into much readier response without having to change gear, but if you do downshift for maximum acceleration to overtake then the surge is very strong, with 50-70 in fourth taking just 6.2 seconds. In third, it's only 4.9 seconds – little more than it takes the standard car to accelerate from 30-50 in third!

It's difficult to directly compare performance figures with the more powerful standard 2.0 TDI engines in the current range, because these all use the 6-speed gearbox, with a radically different set of ratios, but the Superchips press release for its new 1.6 TDI conversion does suggest that the modified car 'offers GTI-style performance'.

Of course, it can't possibly compare with a current 210 PS Mk 6 GTI, but it prompted us to delve back into our road-test archives, where we found figures for not only the 2.0-litre Mk 3 GTI 8V but also the 1.8-litre Mk 2 GTI 8V which are inferior to this modified 1.6-litre Mk 6 Golf TDI!

So, performance is significantly improved, with a much stronger and smoother response in virtually all situations, but surely this must come at some great expense in terms of fuel economy? Not necessarily so. We didn't

have enough time with the car – just a couple of days, mostly in performance mode – to conduct perfectly comparable fuel economy tests, but our notes make interesting reading.

Just for the record, the car itself was showing a long-term average of 51.0 mpg over the previous 2236 miles, although of course that will have included much of the testing and development phase and can't be considered conclusive, just representative.

Our own long-term fuel consumption figures for the standard 1.6 TDI-engined Golfs we've tested range from 56.3 mpg for the Cabriolet to 62.3 for the BlueMotion. Our overall average figure for the Superchips car in modified form, over a 505-mile range, at an average speed of 58 mph, weighed in at 56.6 mpg. Virtually every single journey undertaken returned figures in the high 50s, with even a rather brisk 48-mile cross-country trip producing 54.9 mpg.

***'The Superchips conversion produces excellent performance allied with highly commendable fuel economy...'***

Even more impressive was our standard deliberate economy drive, a steady-state 60-mile motorway cruise, averaging 51 mph, which recorded a staggering 76.8 mpg! That's far from typical, but it shows what can possibly be achieved, in the real world, with a car that can also provide acceleration and mid-range performance superior to a 2.0-litre petrol-powered Mk 3 GTI!

So, for a 1.6-litre TDI engine, the Superchips conversion produces

excellent performance allied with highly commendable fuel economy. Bear in mind that all other aspects of the car – wheels and tyres, suspension and brakes – were still completely standard, but coped perfectly adequately with the improvement in performance. We'd probably recommend a set of upgraded dampers and high-performance brake pads, though, to anyone who'd prefer to regularly drive it 'GTI-style' rather than 'typical TDI'... 

#### PERFORMANCE COMPARISONS

	Superchips Golf 1.6 TDI Modified	Superchips Golf 1.6 TDI Standard	Golf BlueMotion 1.6 TDI	Golf 6 Cabriolet 1.6 TDI	Jetta 1.6 TDI	Mk 3 Golf GTI 8V 2-door	Mk 2 Golf GTI 8V 2-door
Displacement, cc	1598	1598	1598	1598	1598	1984	1781
Power output, PS/kW	148/108	108/79	105/77	105/77	105/77	115/85	112/82
@ rpm	4580	4510	4400	4400	4400	5400	5400
Maximum torque, lb.ft./Nm	226/307	177/241	185/250	185/250	185/250	122/166	117/159
@ rpm	2350	2500	1500-2500	1500-2500	1500-2500	2600	4000
Maximum speed, mph/kph	–	118/190	118/190	118/190	118/190	122/195	118/190
0–50mph, sec	6.4	7.7	7.8	8.6	8.0	6.4	6.7
0–60mph, sec	8.9	10.9	10.4	11.9	11.3	9.1	8.7
0–70mph, sec	11.7	14.7	14.6	16.5	15.0	12.3	11.4
0–80mph, sec	15.3	18.9	18.7	20.9	19.7	16.3	–
30–50mph (third gear), sec	3.8	4.6	4.5	5.6	4.5	5.1	4.7
30–50mph (fourth gear), sec	6.5	8.2	8.5	9.0	8.0	7.3	6.4
50–70mph (third gear), sec	4.9	5.7	5.6	7.9	5.8	5.4	–
50–70mph (fourth gear), sec	6.2	7.5	7.2	9.0	7.4	7.8	6.6
50–70mph (fifth gear), sec	7.8	9.8	10.5	12.1	7.3	8.6	9.4
50–70mph (sixth gear), sec	–	–	–	–	–	–	–
Overall fuel con, mpg/l/100 km	56.6/5.0	51.0/5.5*	62.3/4.5	56.3/5.0	58.6/4.8	29.1/9.7	34.1/8.3
Unladen weight, lb/kg	2905/1318	2905/1318	2897/1314	3309/1501	3075/1395	2613/1185	2029/920
Power/weight ratio, PS/ton, PS/tonne	114/112	83/82	81/80	71/69	76/75	98/97	123/122
Test publication date	Jan '13	Jan '13	Oct '10	Jan '12	Sept '11	July '98	Feb '92

\* See text

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